
From: Trey Driscoll <tdriscoll@dudek.com>
Sent: Thursday, May 16, 2019 4:56 PM
To: Michele Staples; Tom Watson; tharder@thomashardercompany.com; Steve Anderson; anthony.brown@aquilogic.com; 'Robert Wagner'; Boyd Hill; rmcglothlin@omm.com; Bob Abrams
Cc: Daniel Ritter; Jay Jones
Subject: RE: BORREGO VALLEY TECHNICAL MEETINGS
Attachments: USGS Model Calibration Wells.pdf; Borrego Model Hydrographs.pdf; Model Calibration Wells.xlsx

Borrego Valley Technical Meetings Team:

Attached are the following requested documents:

1. Map showing the location of all calibration wells with their names labeled (File: USGS Model Calibration Wells)
2. Hydrographs of each calibration well showing both measured and model-generated data over time (File: Borrego Model Hydrographs)
3. Excel List of Local Well Name, abbreviated State Well Identifier, Complete State Well Identifier, Location Information, Record of Data, Number of Observations in Original USGS Model and Dudek Updated Model, and Total Observations (File: Model Calibration Wells)

Please contact me if you have any questions or require additional information.

Cheers,
Trey

From: Michele Staples <MStaples@jacksontidus.law>
Sent: Wednesday, May 8, 2019 2:52 PM
To: Trey Driscoll <tdriscoll@dudek.com>; Tom Watson <tom.watson@aquilogic.com>; McGlothlin, Russell (RMcGlothlin@bhfs.com) <RMcGlothlin@bhfs.com>; tharder@thomashardercompany.com; Steve Anderson <steve.anderson@bbklaw.com>; geoff@borregowd.org; Leanne.Crow@sdcounty.ca.gov; anthony.brown@aquilogic.com; Bennett, Jim <Jim.Bennett@sdcounty.ca.gov>; 'Robert Wagner' <rcwagner@wbecorp.com>; Boyd Hill <BHill@jacksontidus.law>
Cc: Daniel Ritter <dritter@dudek.com>; Jay Jones <environavigation@gmail.com>
Subject: RE: BORREGO VALLEY TECHNICAL MEETINGS

Trey, as you requested, here are questions from AAWARE's technical consultants:

1. With respect to the GSP's target pumping rate of 5,700 afy:
 - 1) Please provide an explanation as to how the 5700 afy target pumping rate was determined.
 - 2) Does the 5,700 afy value include irrigation return flows?
 - 3) Does the 5,700 afy value include underflow from upstream areas?
 - 4) Were any forward model runs performed by Dudek evaluating production above the GSP's proposed 5,700 afy target pumping rate? If so, please provide the results.
2. With respect to Appendix C of Dudek (2018):

- 1) What do the red dates represent?
 - 2) Please provide a map showing the location of all calibration wells with their names labeled as per Appendix C.
 - 3) Please provide hydrographs of each calibration well showing both measured and model-generated data over time.
3. With respect to the uncertainty analysis in the Environmental Navigation Services, Inc. (ENSI) report, dated September 12, 2018:
- 1) The analysis was conducted using a spreadsheet model. Has Dudek or ENSI conducted this analysis using the USGS numerical groundwater flow model? If so, how do the results compare?
 - 2) The uncertainty analysis focuses on the inflow and outflow terms of the model. Has any uncertainty analysis been performed of the aquifer parameters in the USGS numerical model? If so, was there an analysis evaluating all of these uncertainties together? Please provide the results of these analyses.
 - 3) Has any uncertainty analysis been performed of the sustainable yield estimate (target pumping rate) of the basin following the first 20 years (the ENSI uncertainty analysis addresses only the first 20 years during transitional pumping ramp down)? If so, please provide the results of this analysis.

Please let us know if you can provide the requested information by return email by May 14 without the need for review in a second technical meeting or conference call. Thank you

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From: Trey Driscoll [<mailto:tdriscoll@dudek.com>]
Sent: Saturday, April 27, 2019 2:25 PM
To: Michele Staples; Tom Watson; McGlothlin, Russell (RMcGlothlin@bhfs.com); tharder@thomashardercompany.com; Steve Anderson; geoff@borregowd.org; Leanne.Crow@sdcounty.ca.gov; anthony.brown@aquilogic.com; Bennett, Jim; 'Robert Wagner'; Eric Larson; Boyd Hill
Cc: Daniel Ritter; Jay Jones
Subject: BORREGO VALLEY TECHNICAL MEETINGS

All,

It was a pleasure to meet with the technical representatives yesterday. In order to make the next meeting as productive as possible, please submit meeting topics and/or questions in writing so that the appropriate staff are available to provide you with the technical information requested. If you require simple clarification of definitions used or tabulated model results it may be more productive to review those details over a conference call with the model team.

Additionally, Dr. Jay Jones is unavailable to meet on May 10, 2019 to discuss the following document:
Methodology To Examine Future Groundwater Overdraft In Terms Of The Overall Hydrologic Water Balance
Considering Recharge Variability And Parameter Uncertainty. Memorandum to BWD from Jay Jones.
September 12, 2018

Jay is available to meet early the week of May 13th. Please advise as to whether the technical team would like to keep
our current meeting on May 10th or propose a new date and time in order to include Jay.

Have a nice week-end!

Cheers,
Trey

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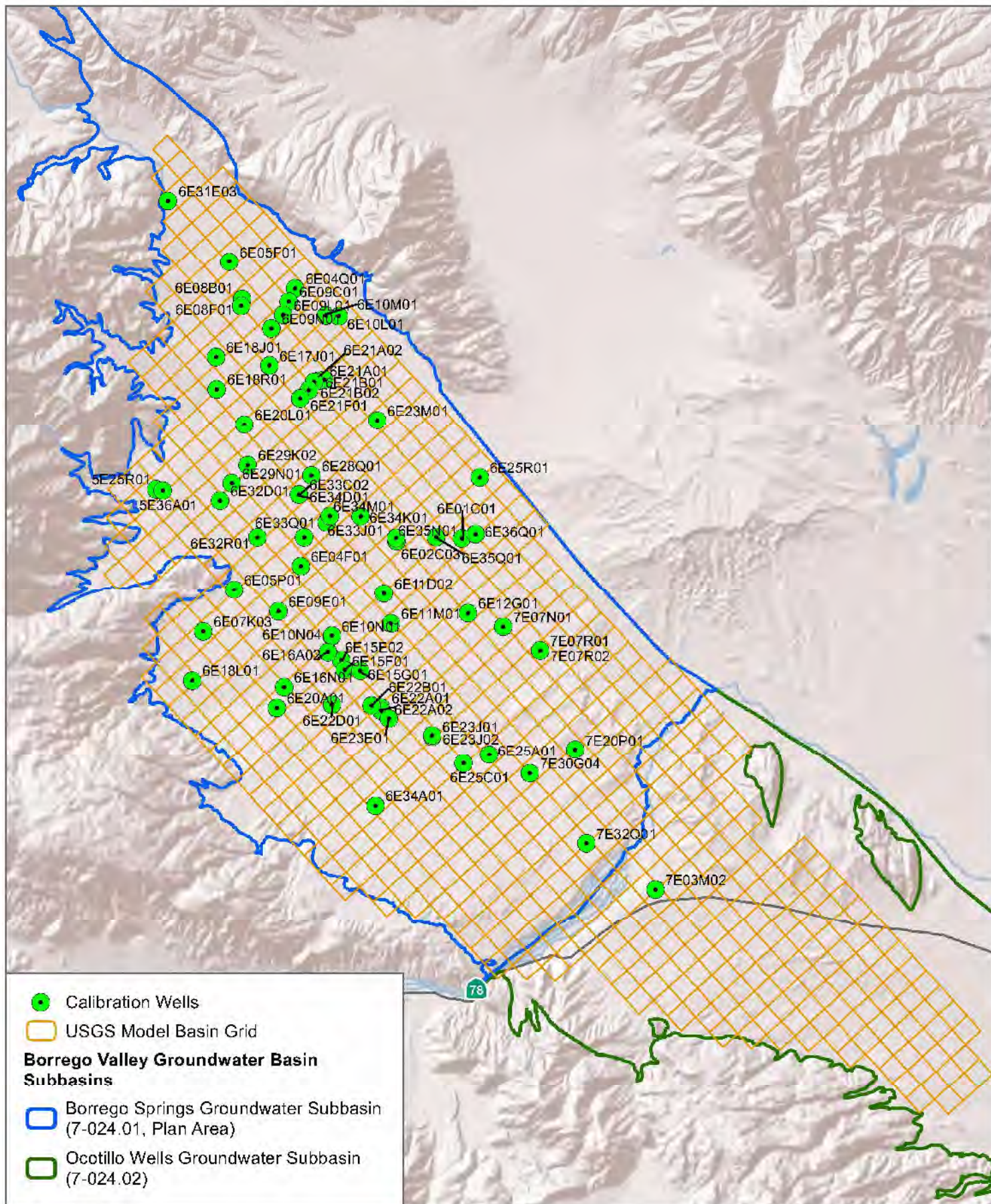
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DRAFT May 2019

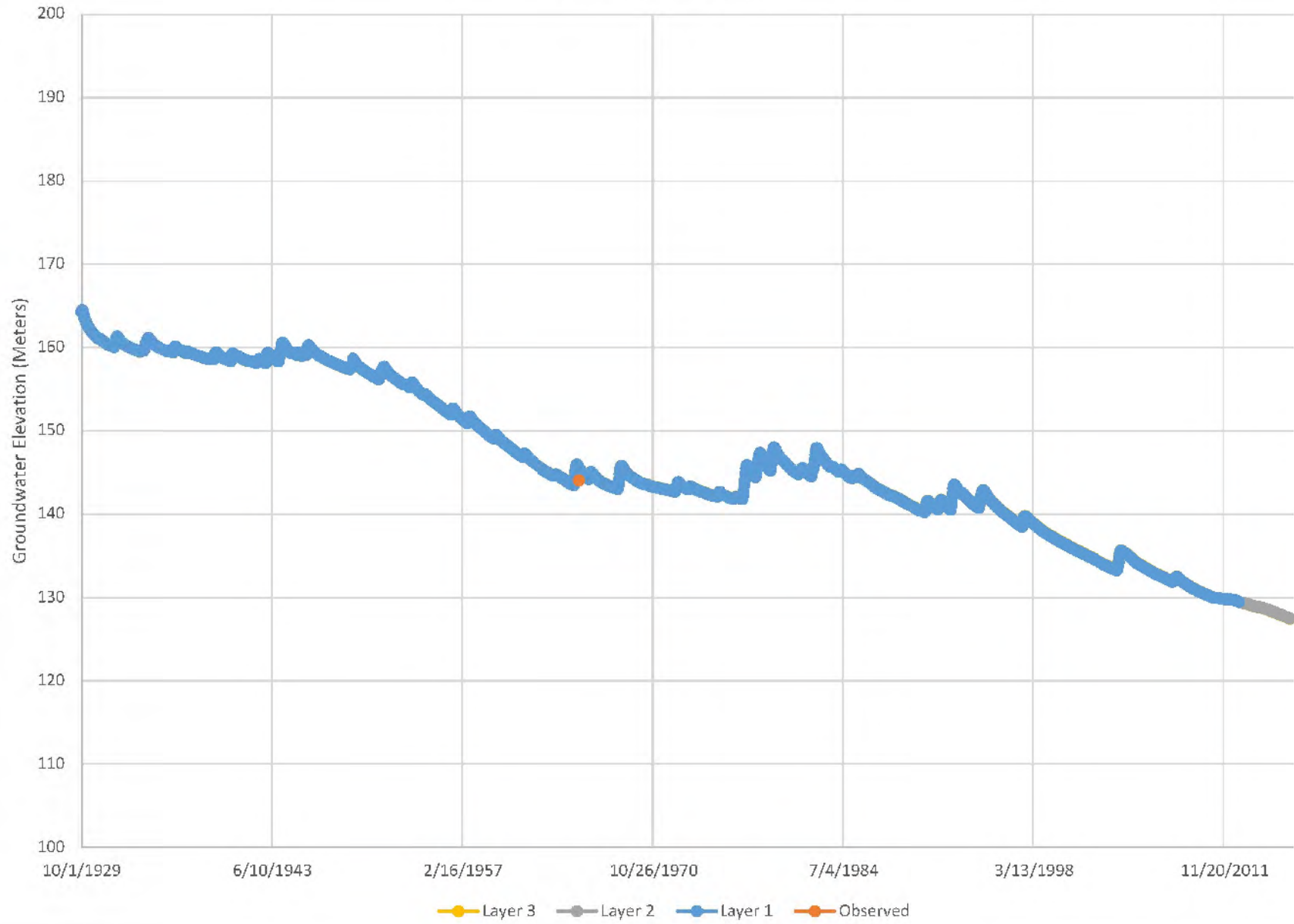
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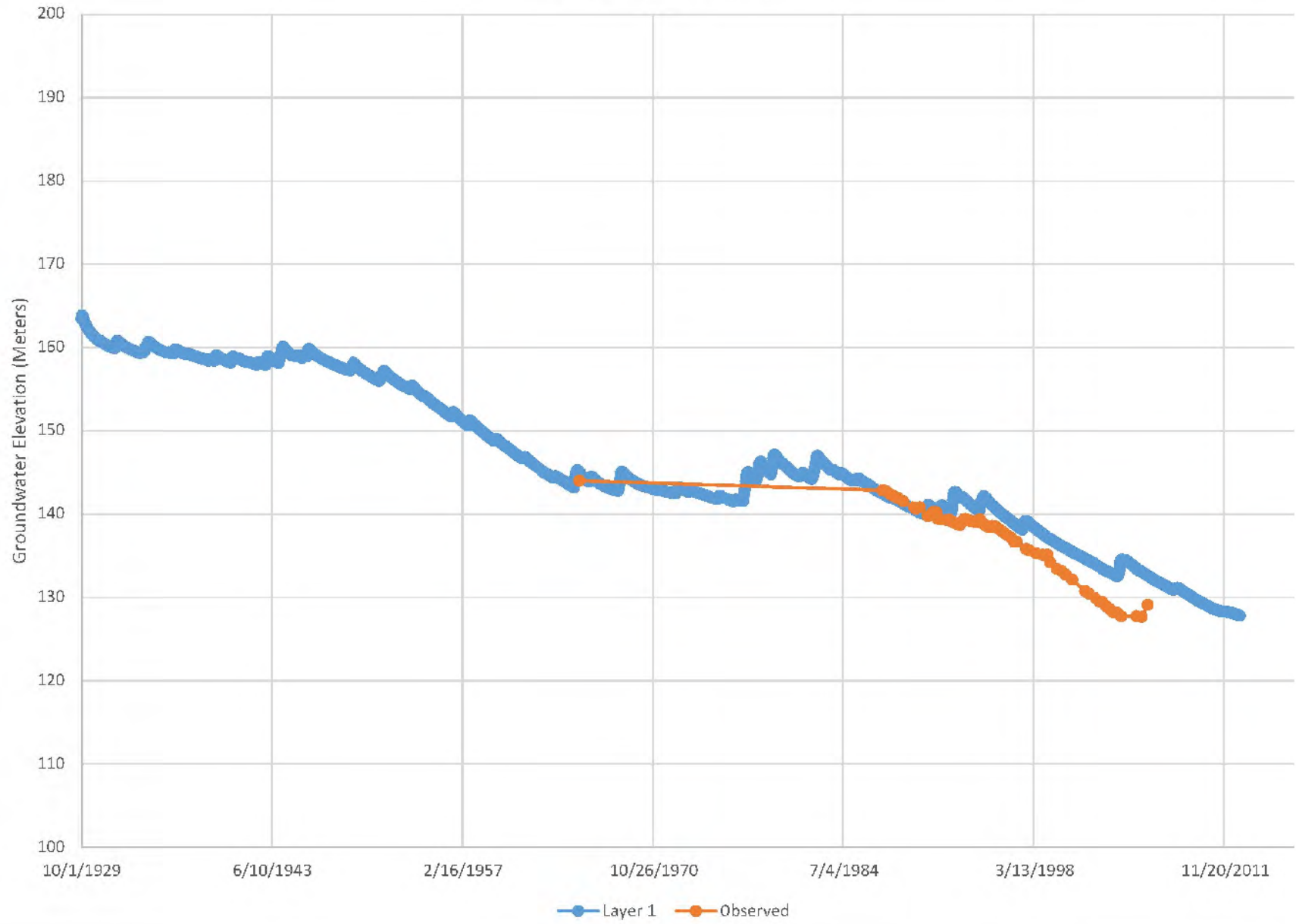
Model Calibration Wells

Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin

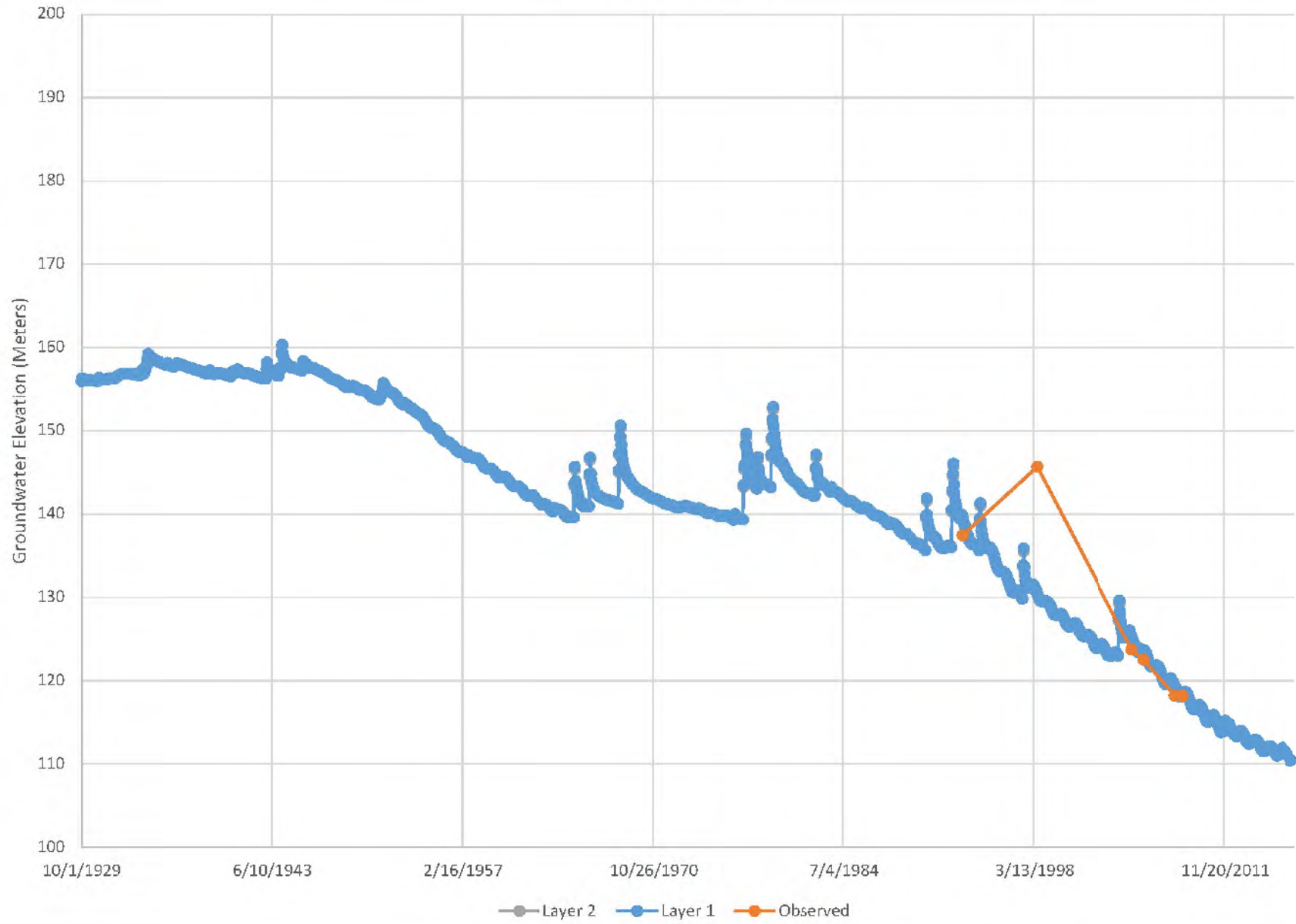
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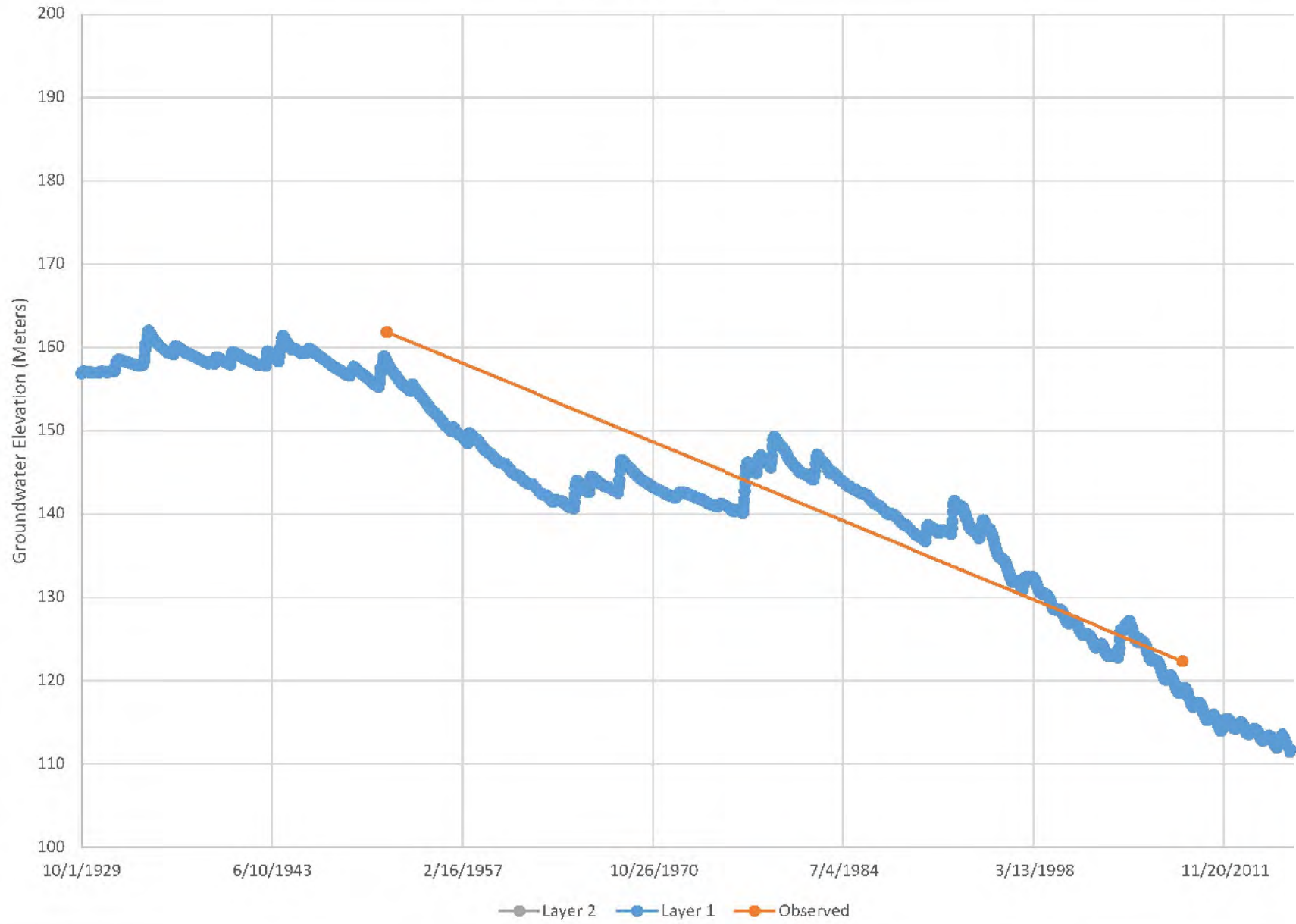
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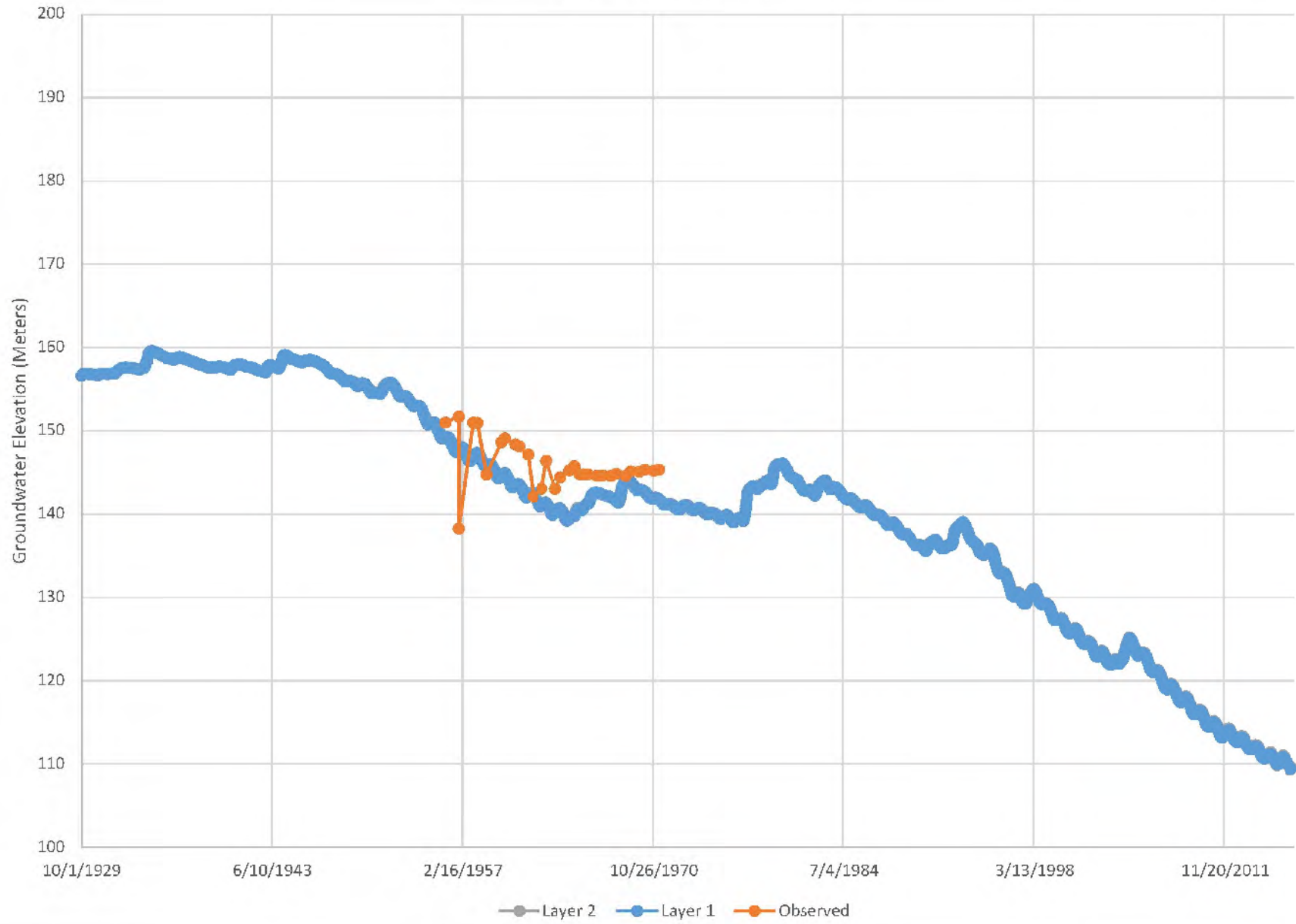
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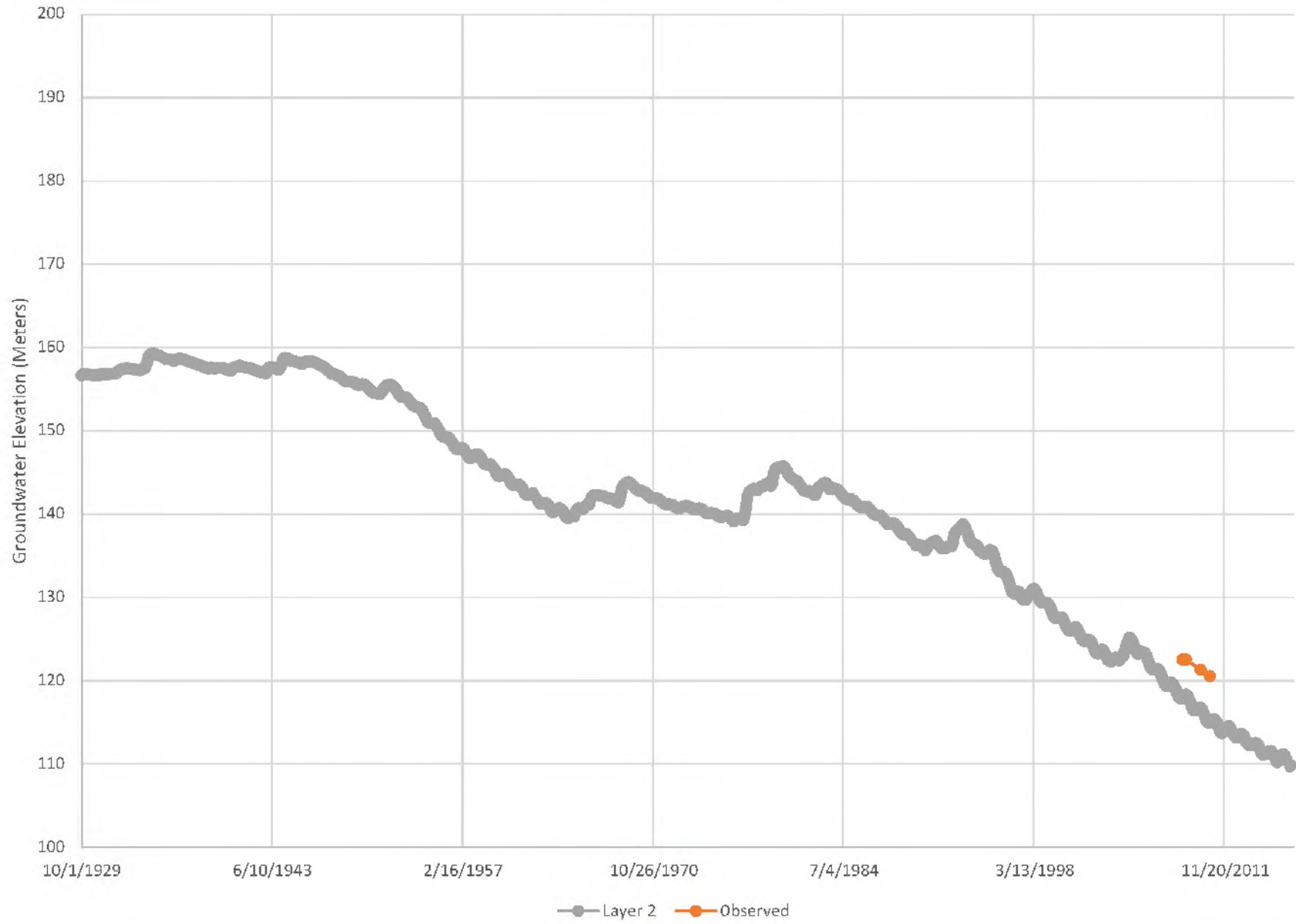
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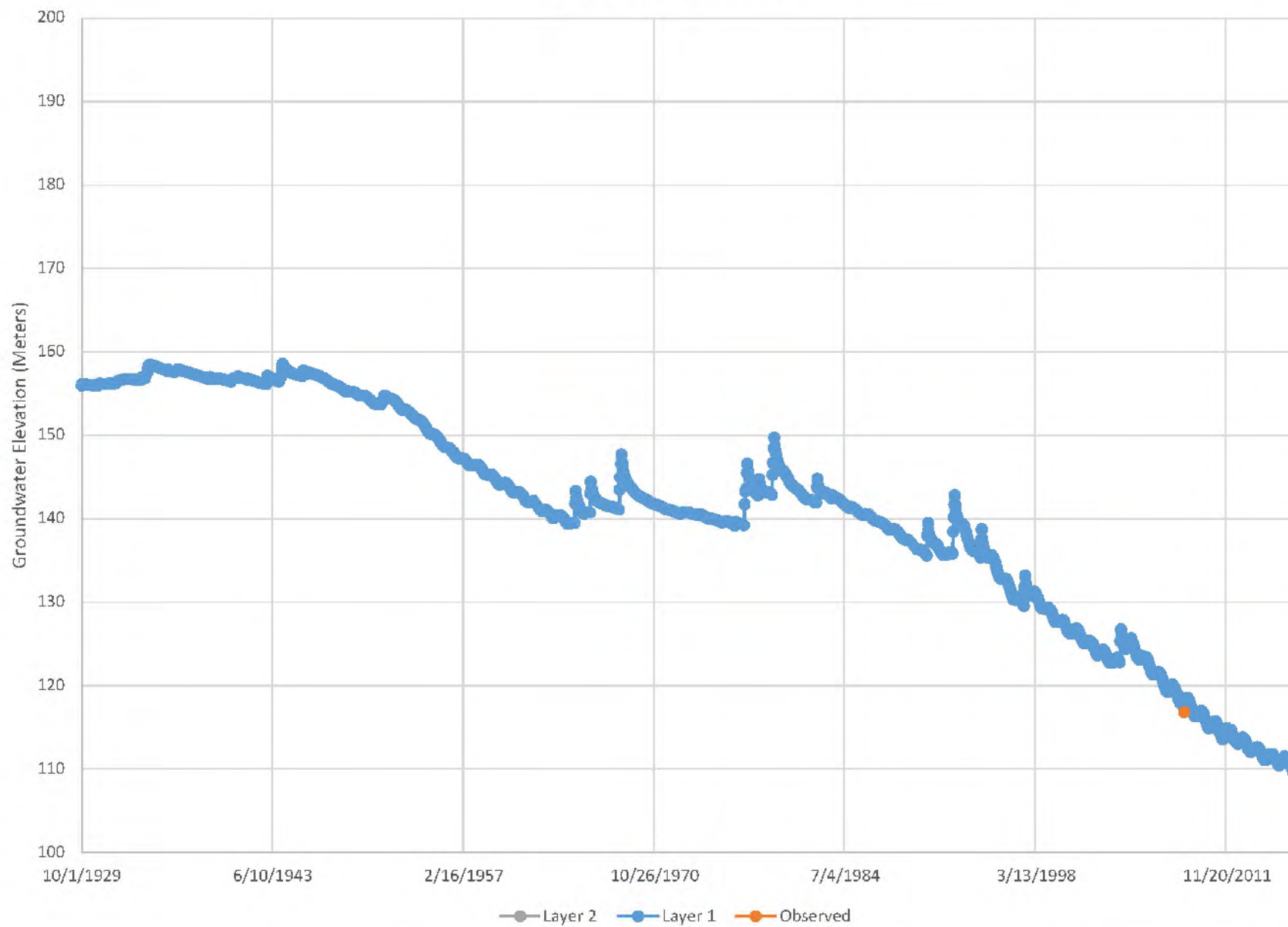
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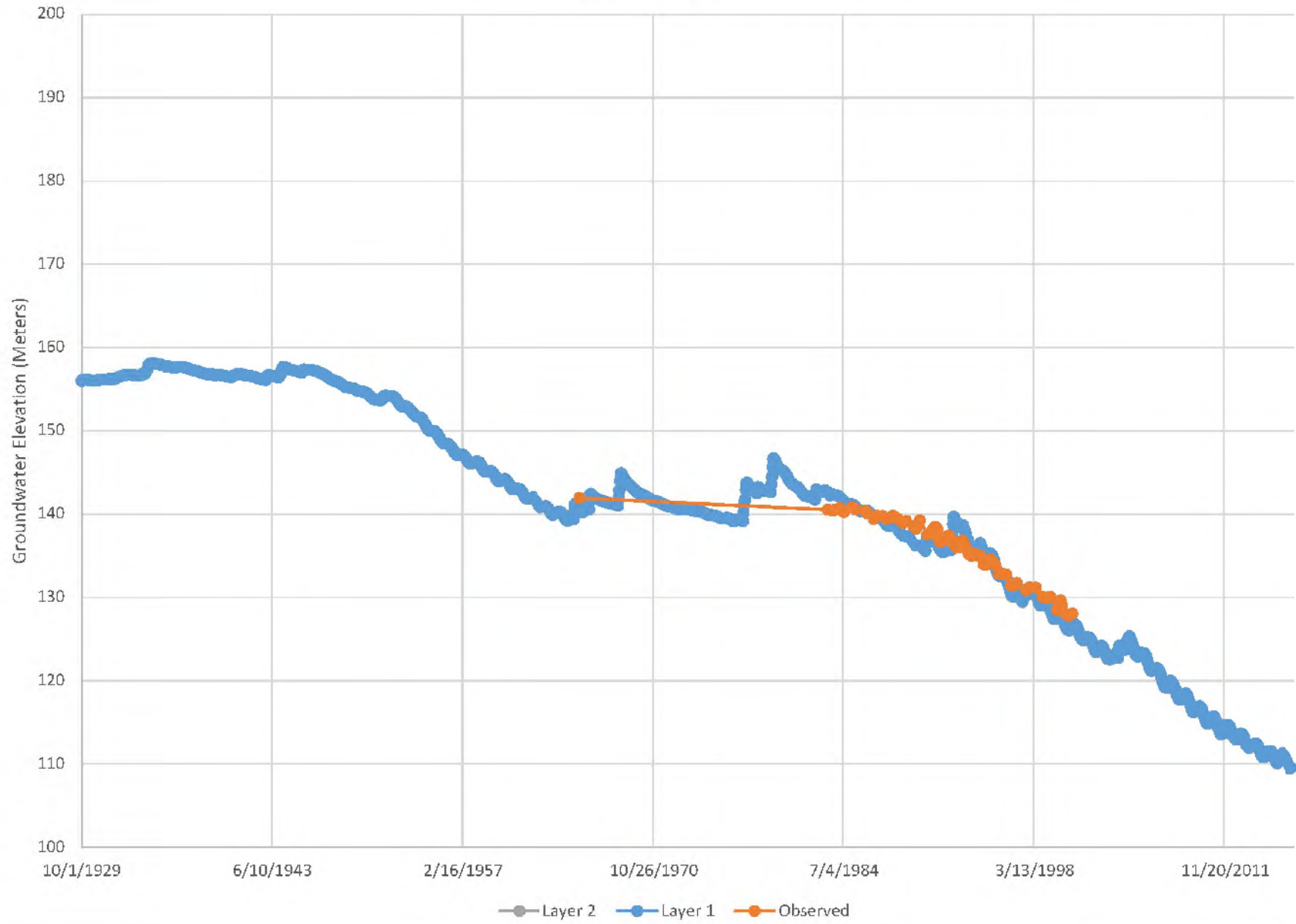
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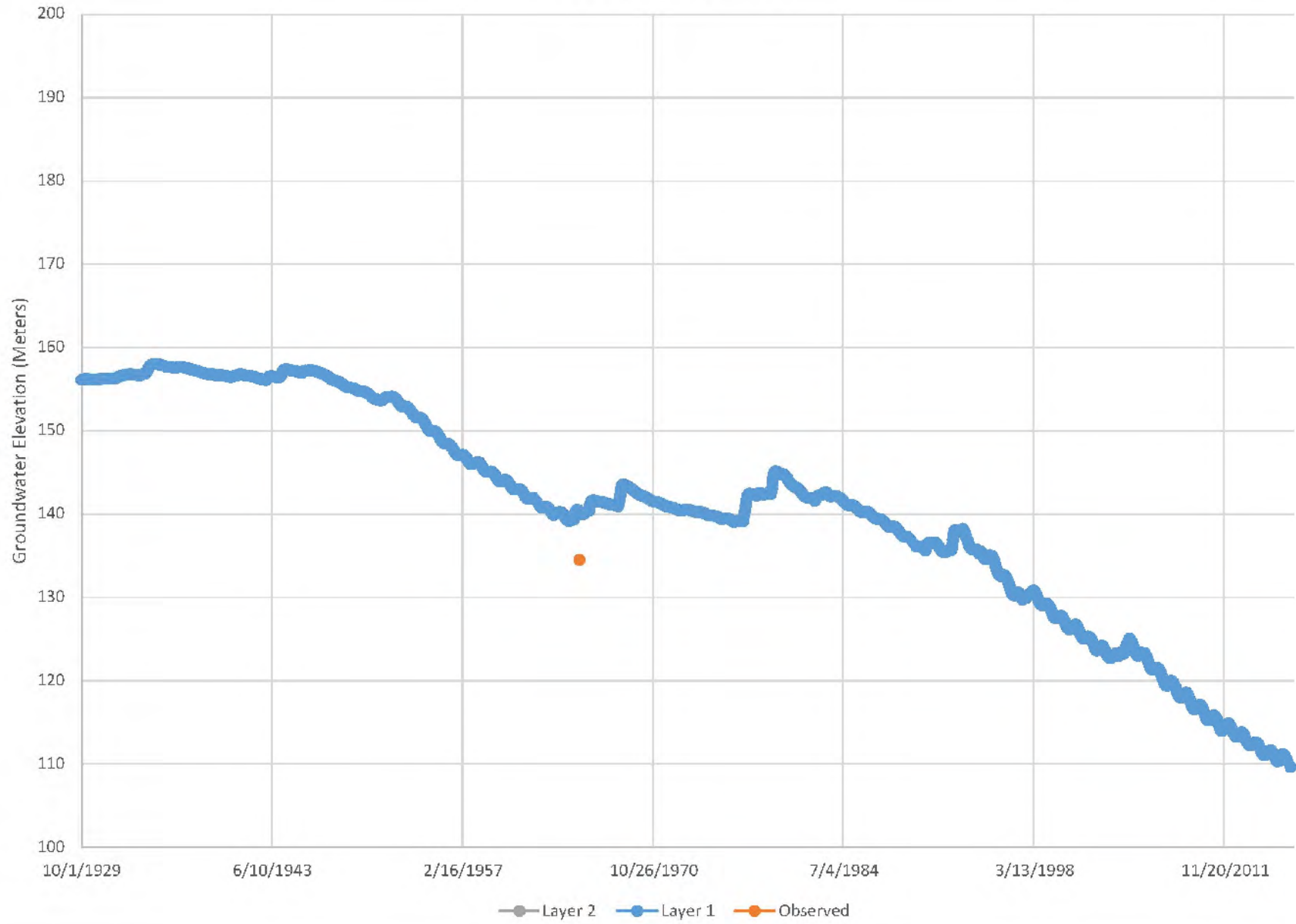
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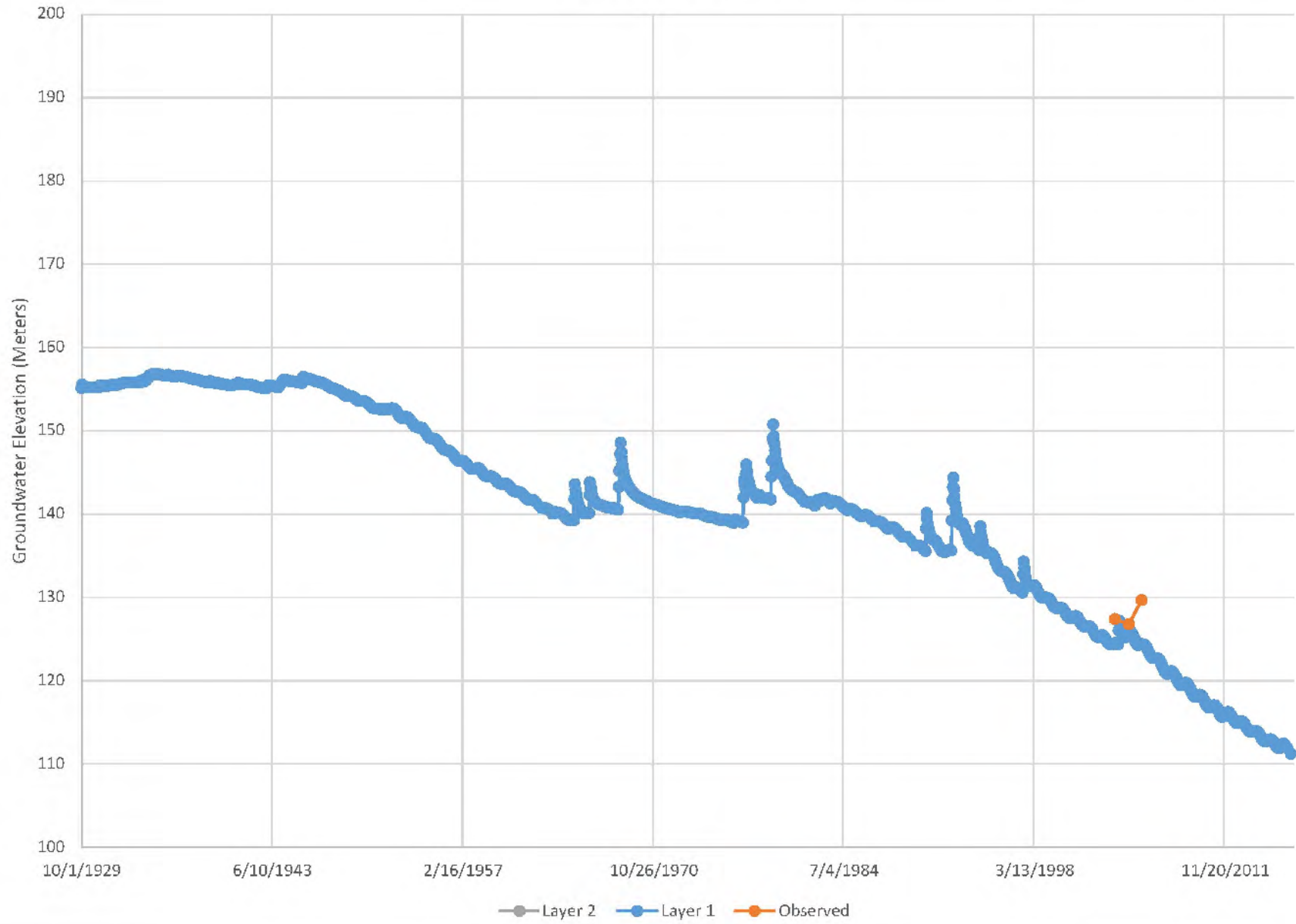
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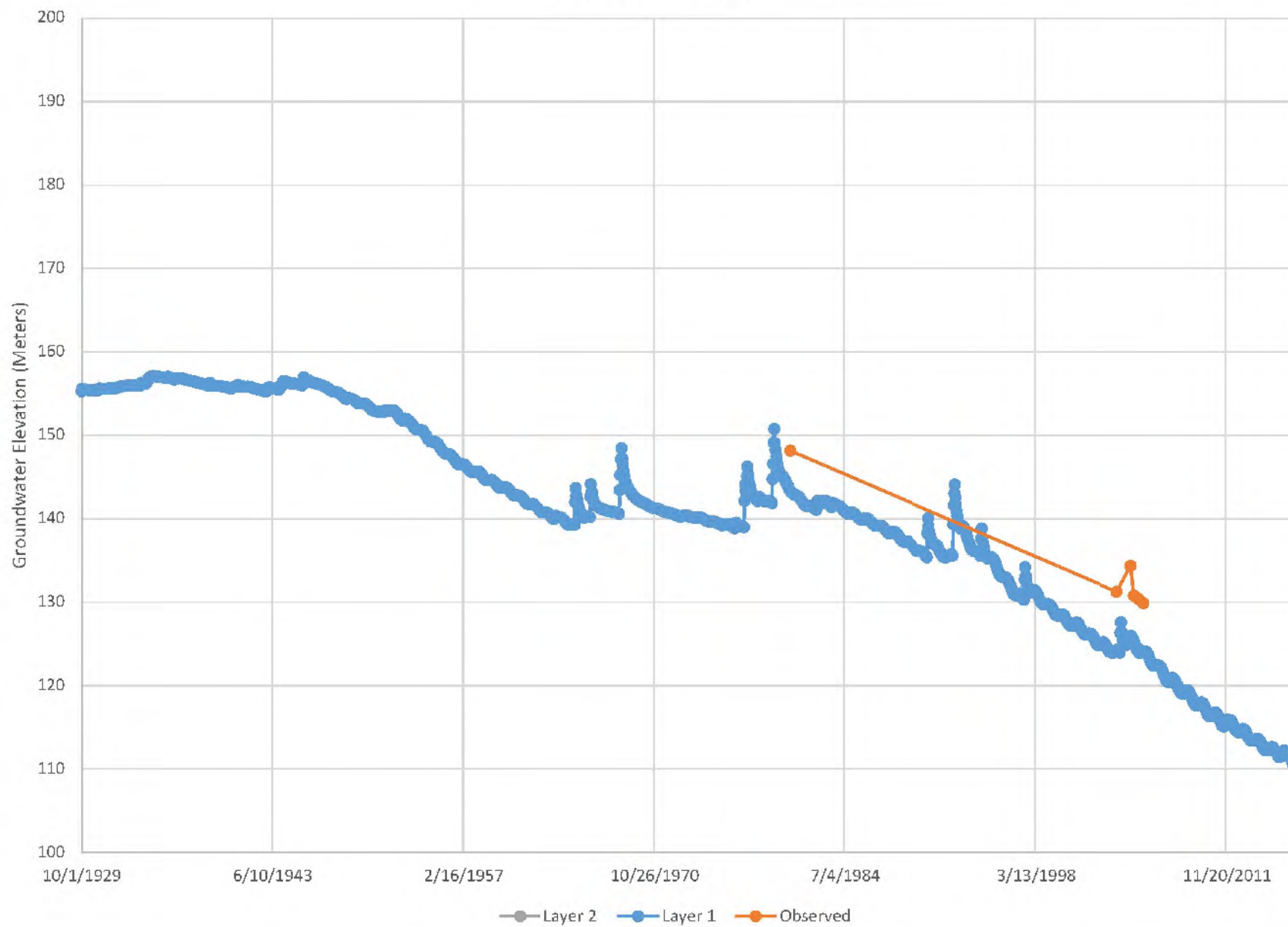
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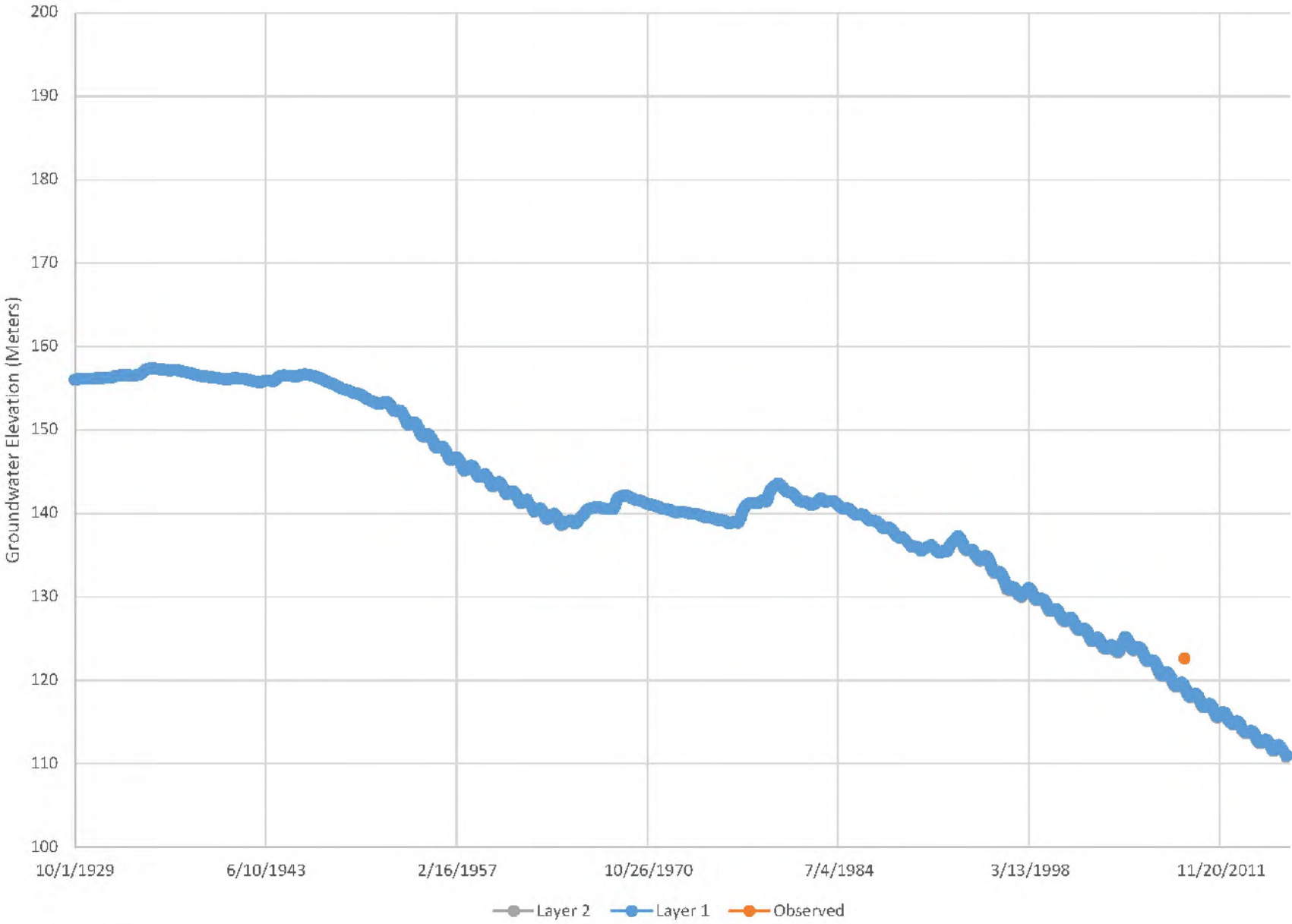
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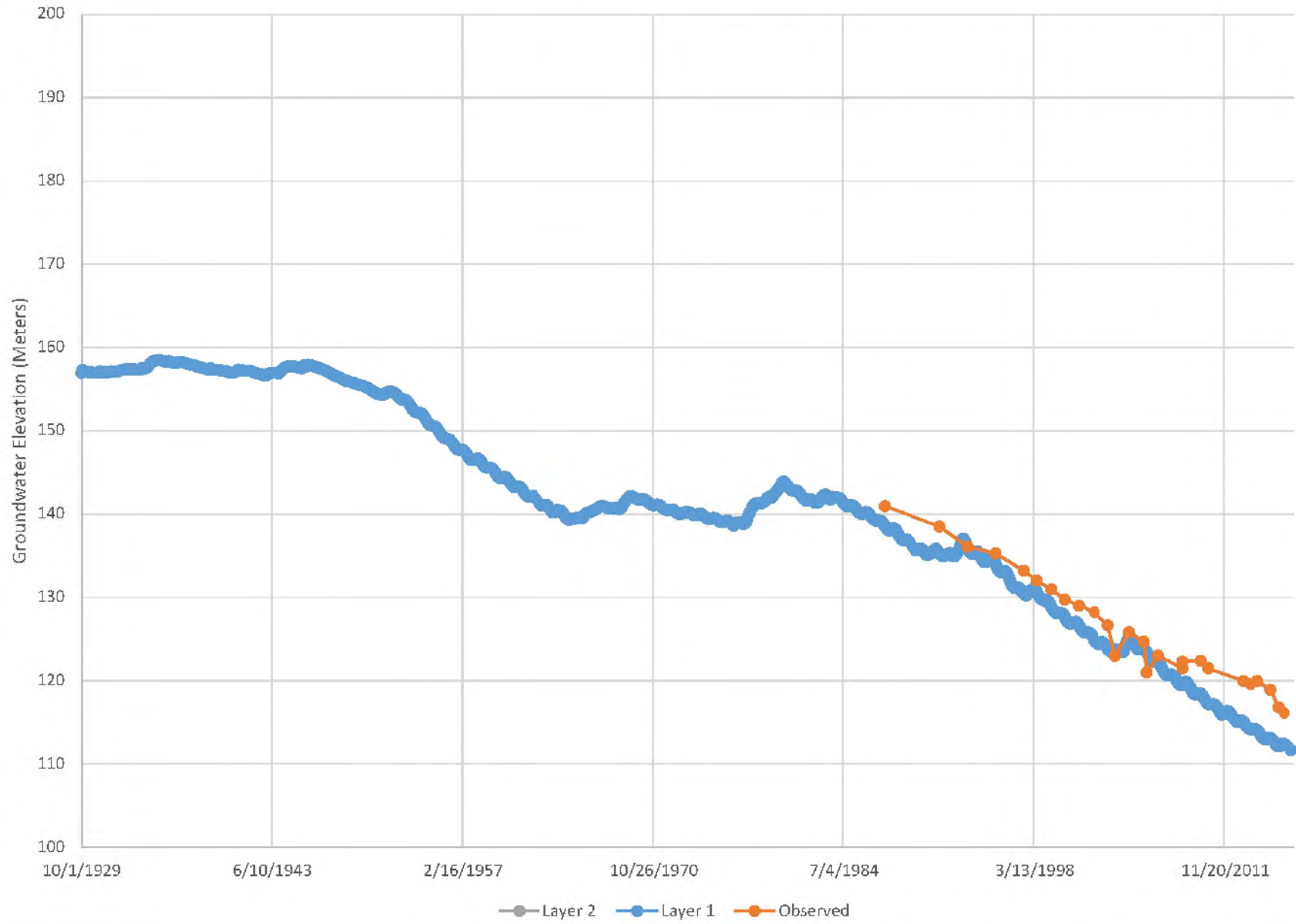
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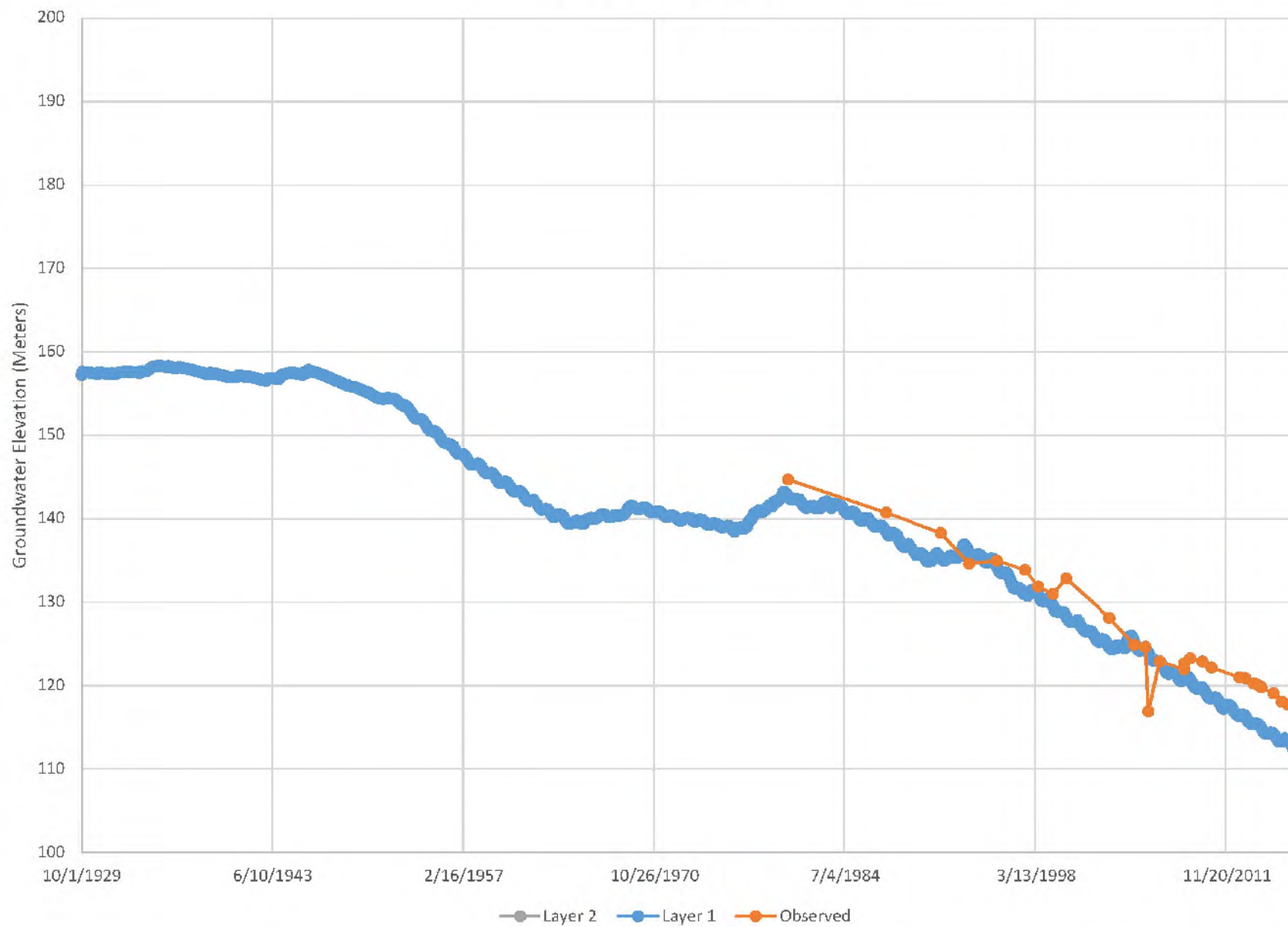
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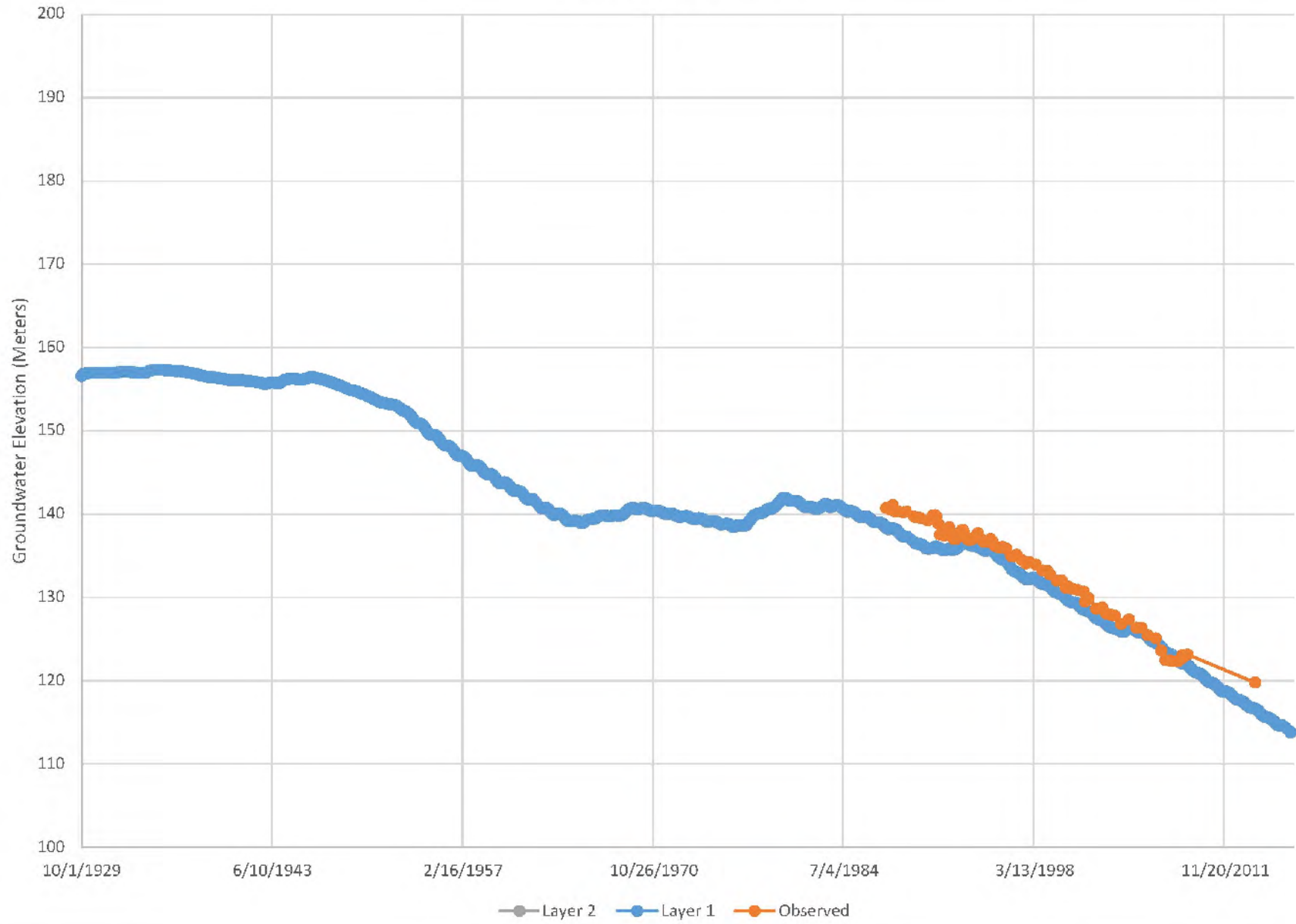
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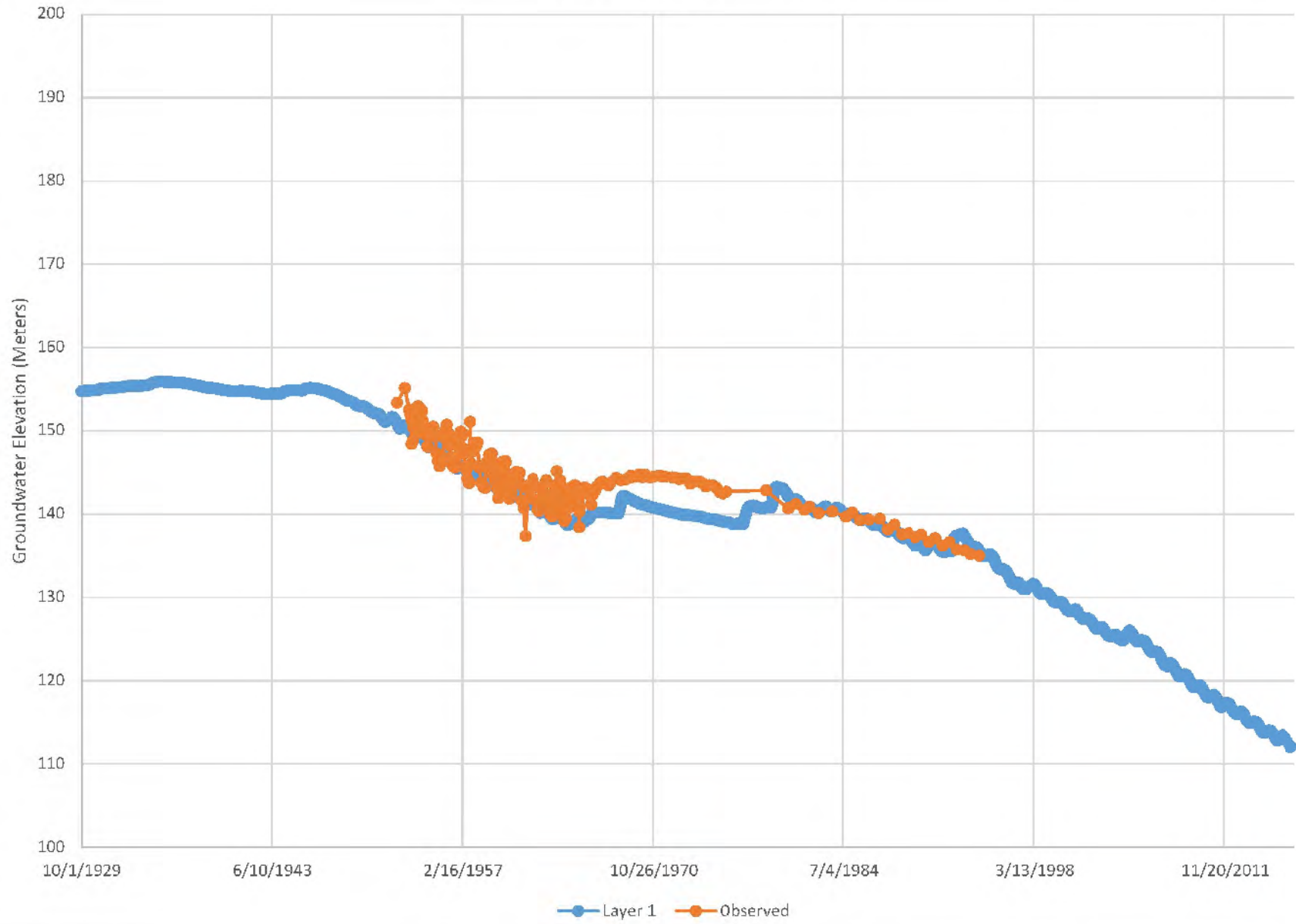
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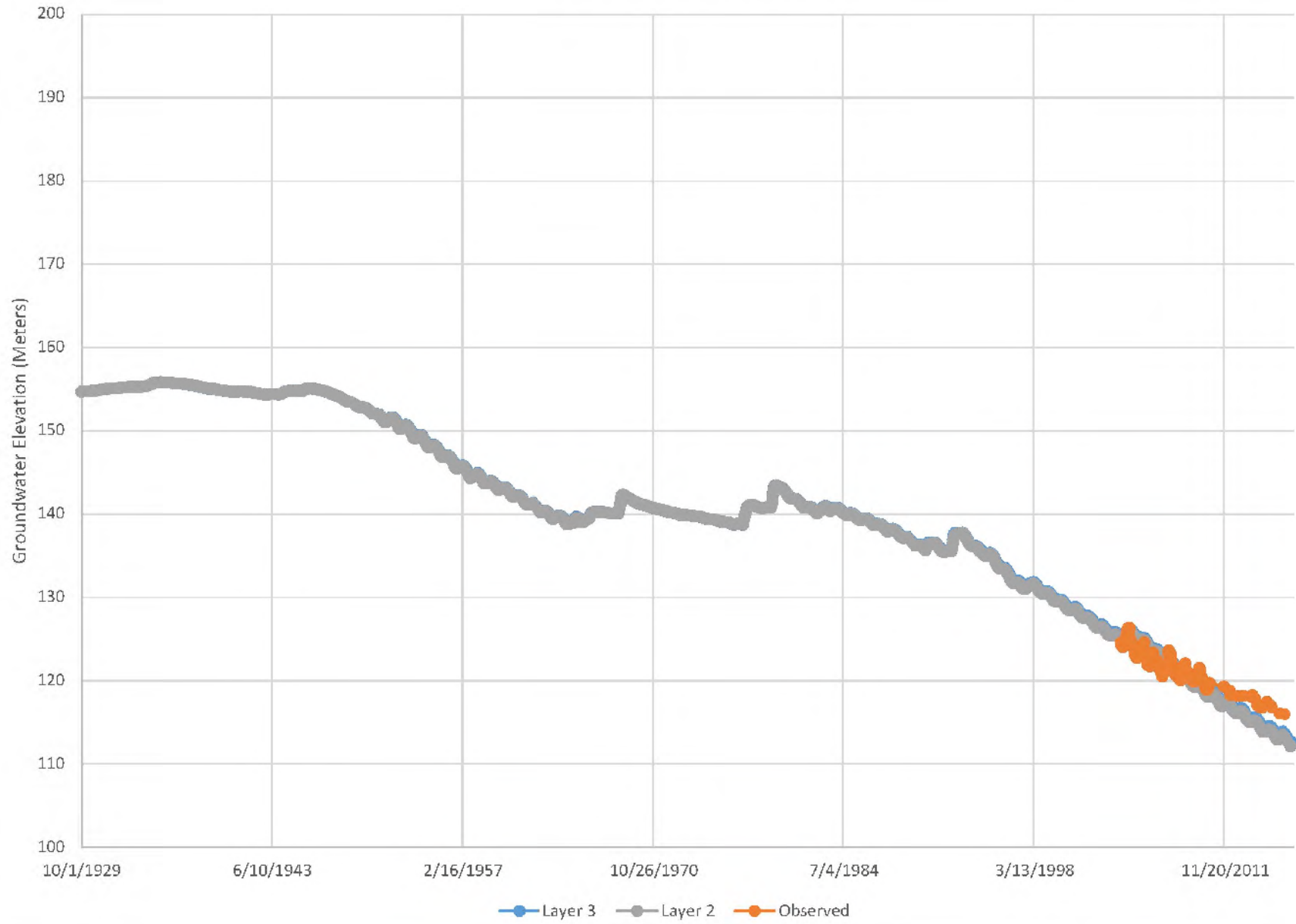
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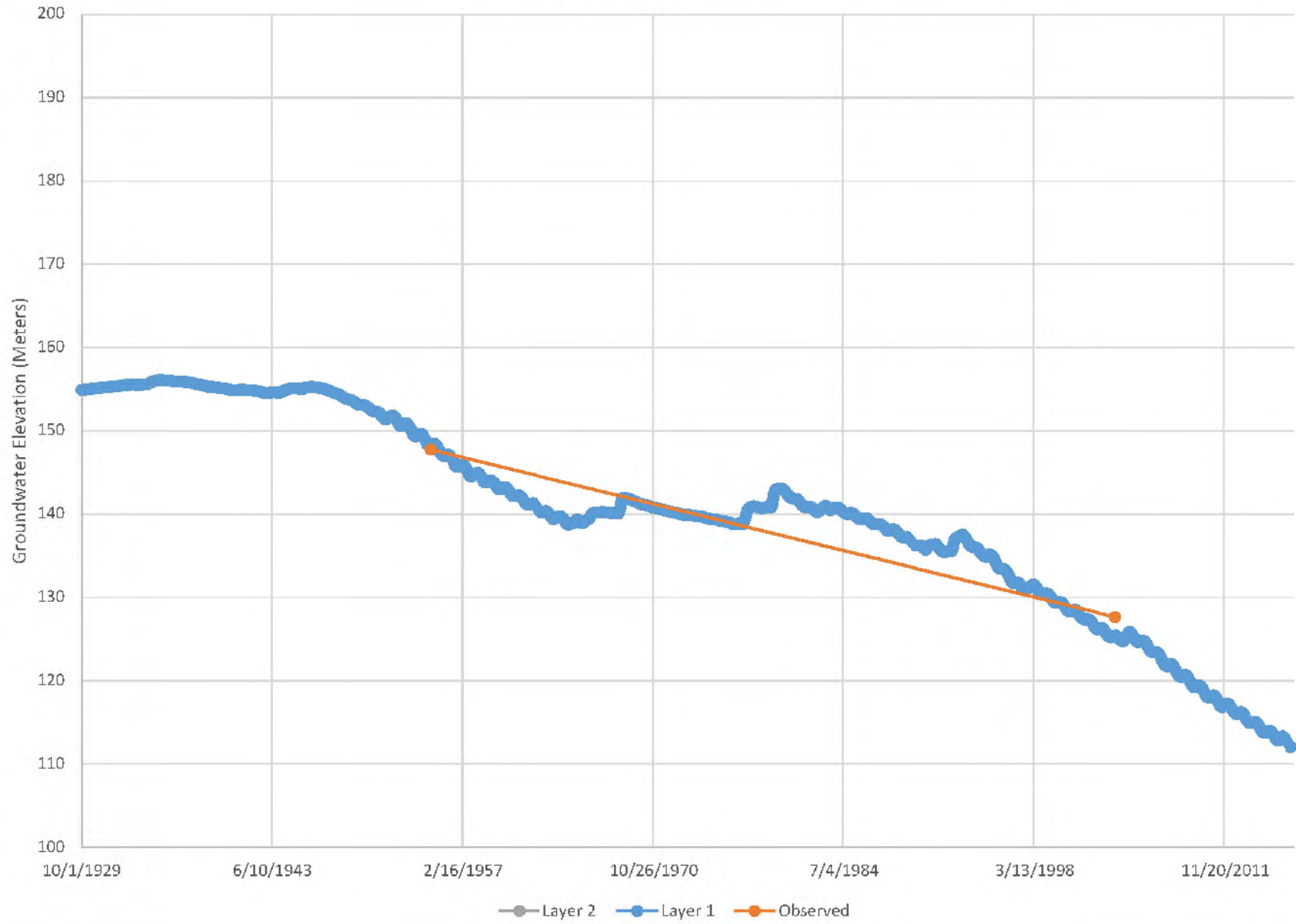
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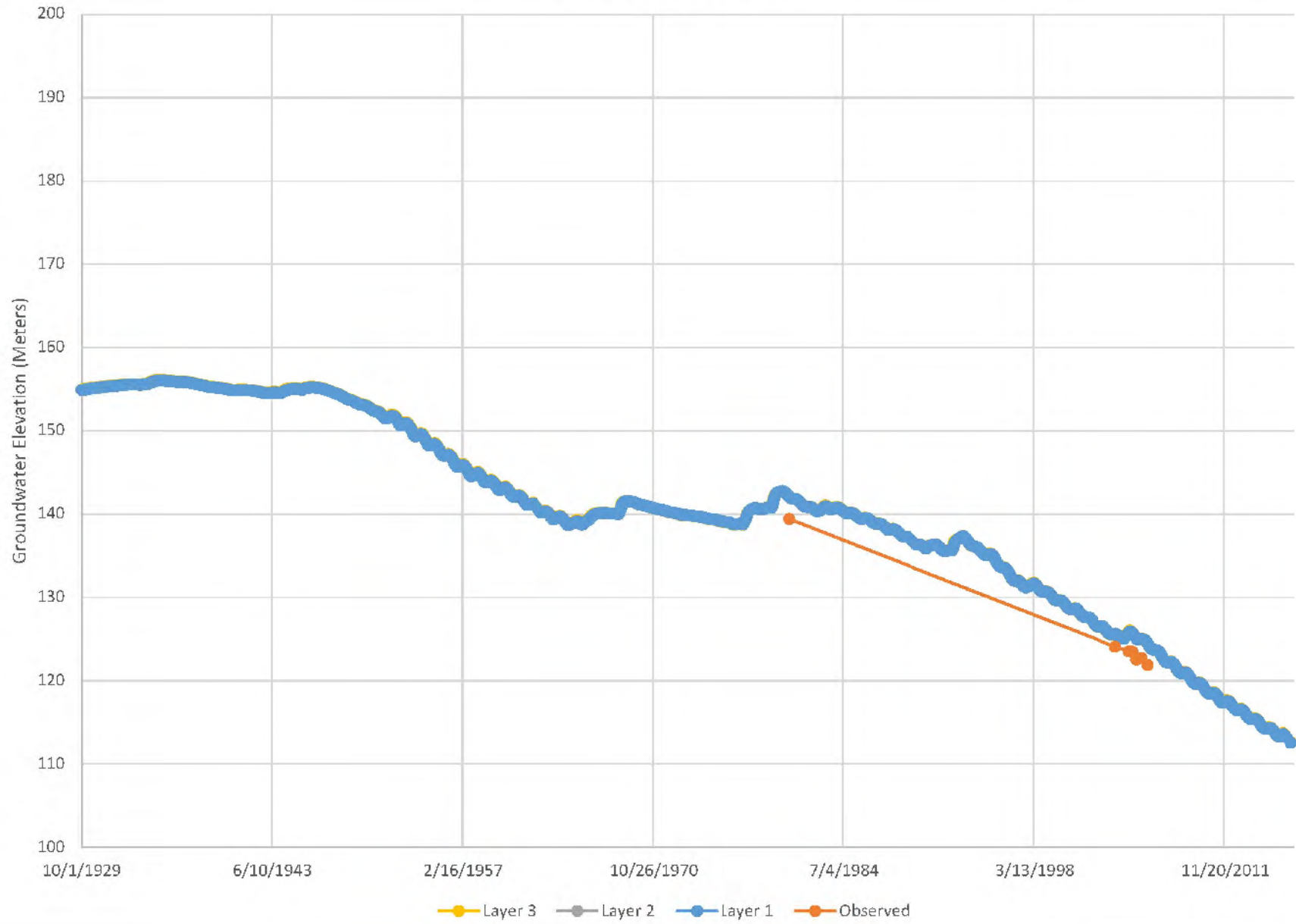
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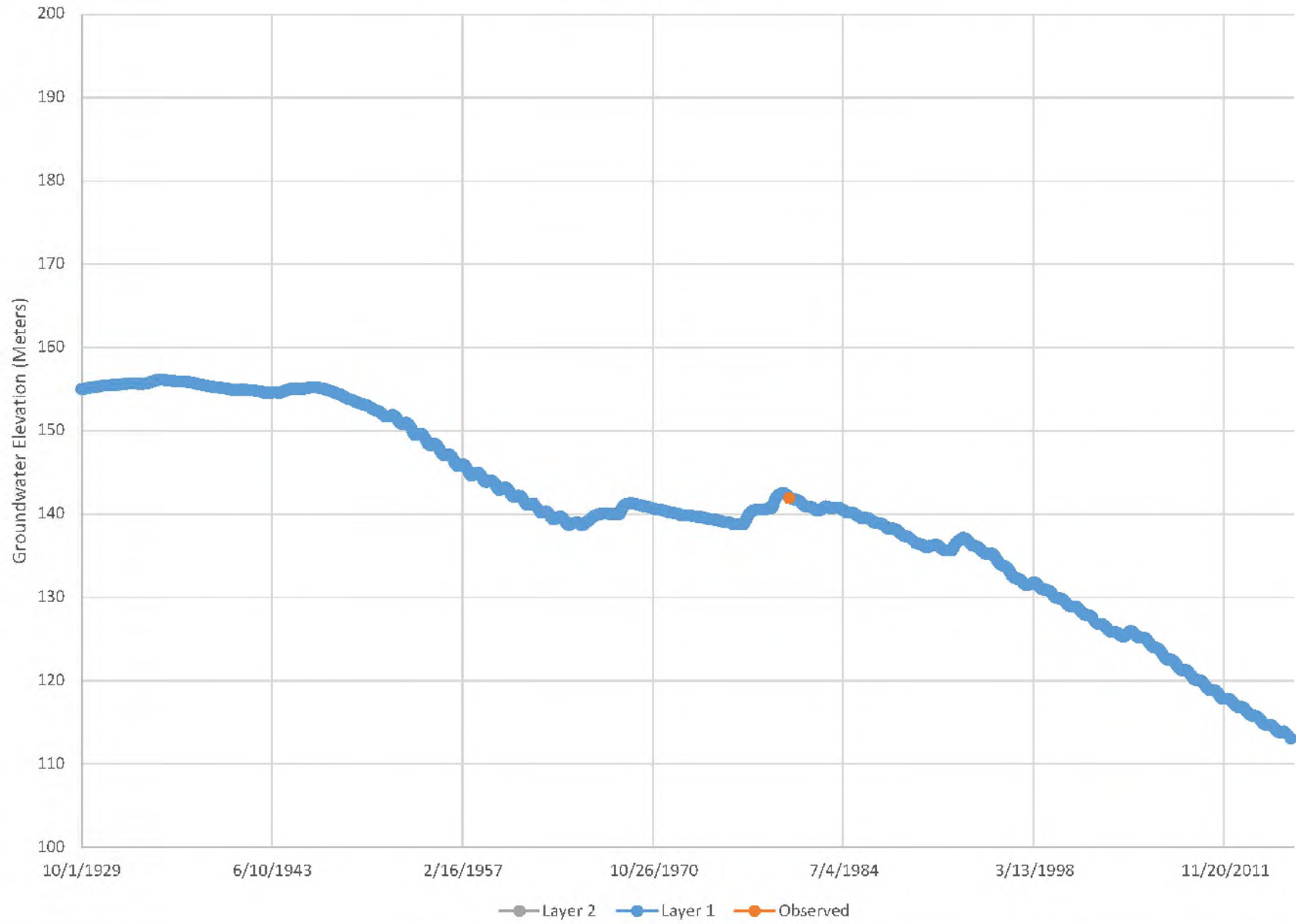
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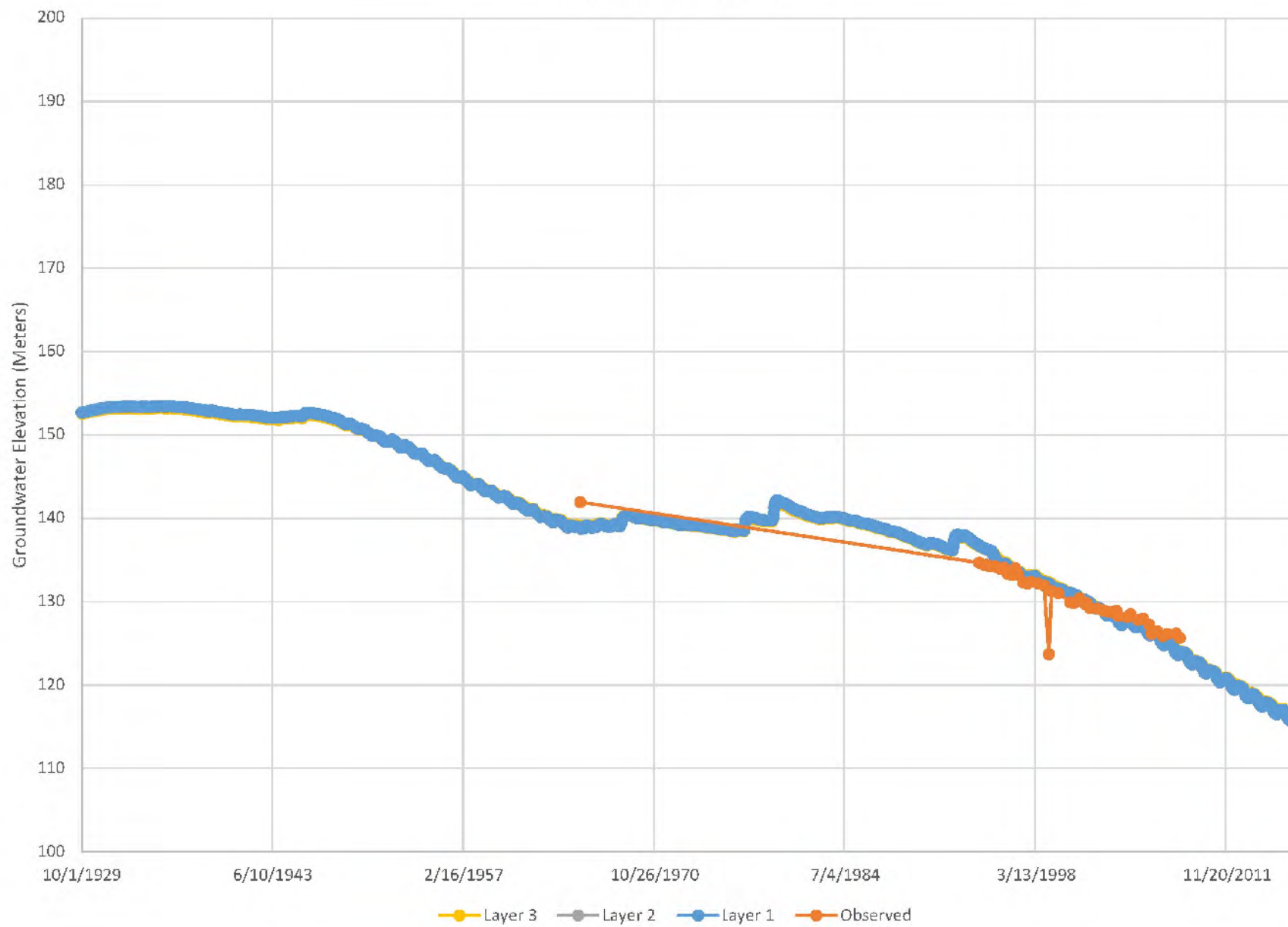
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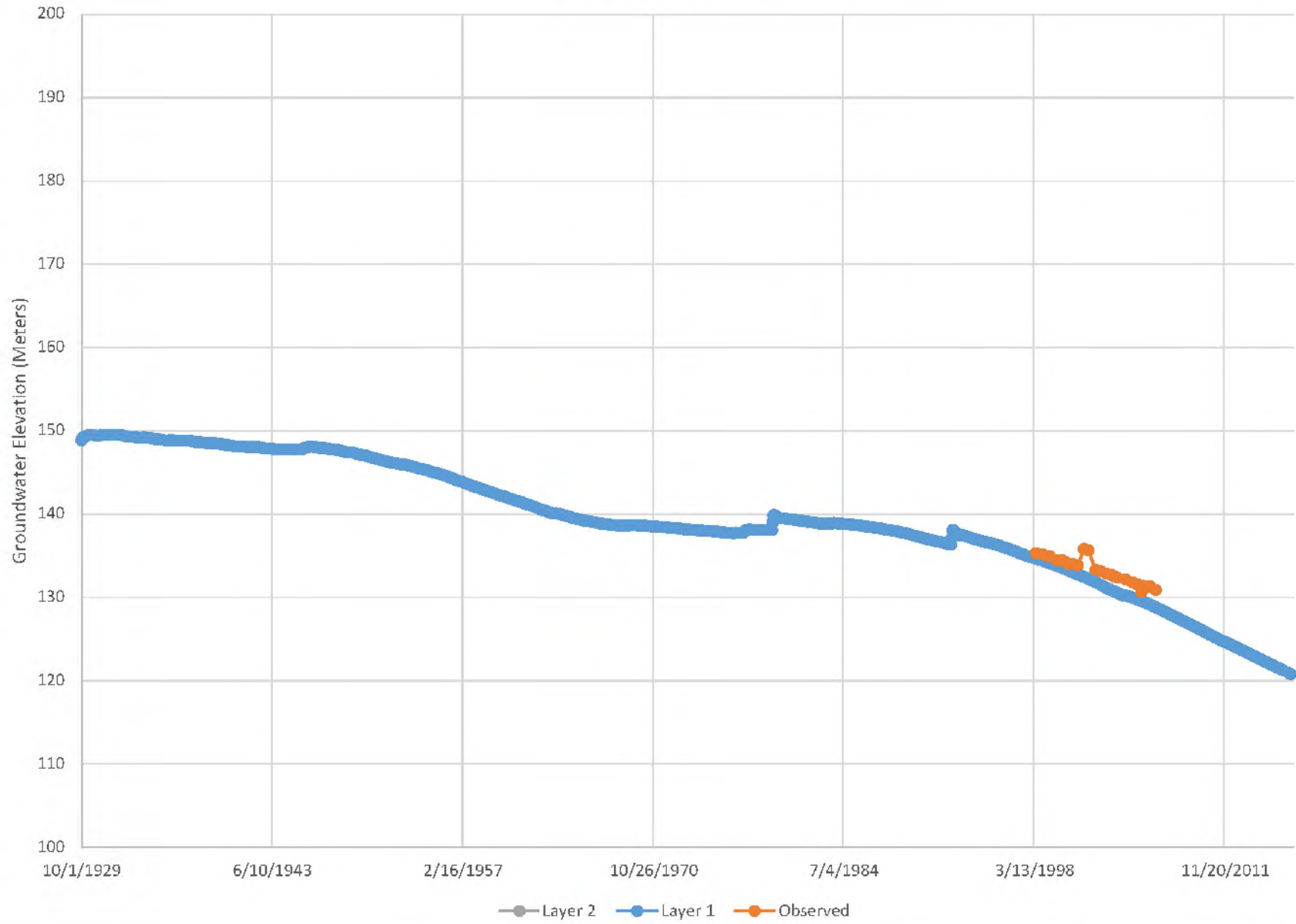
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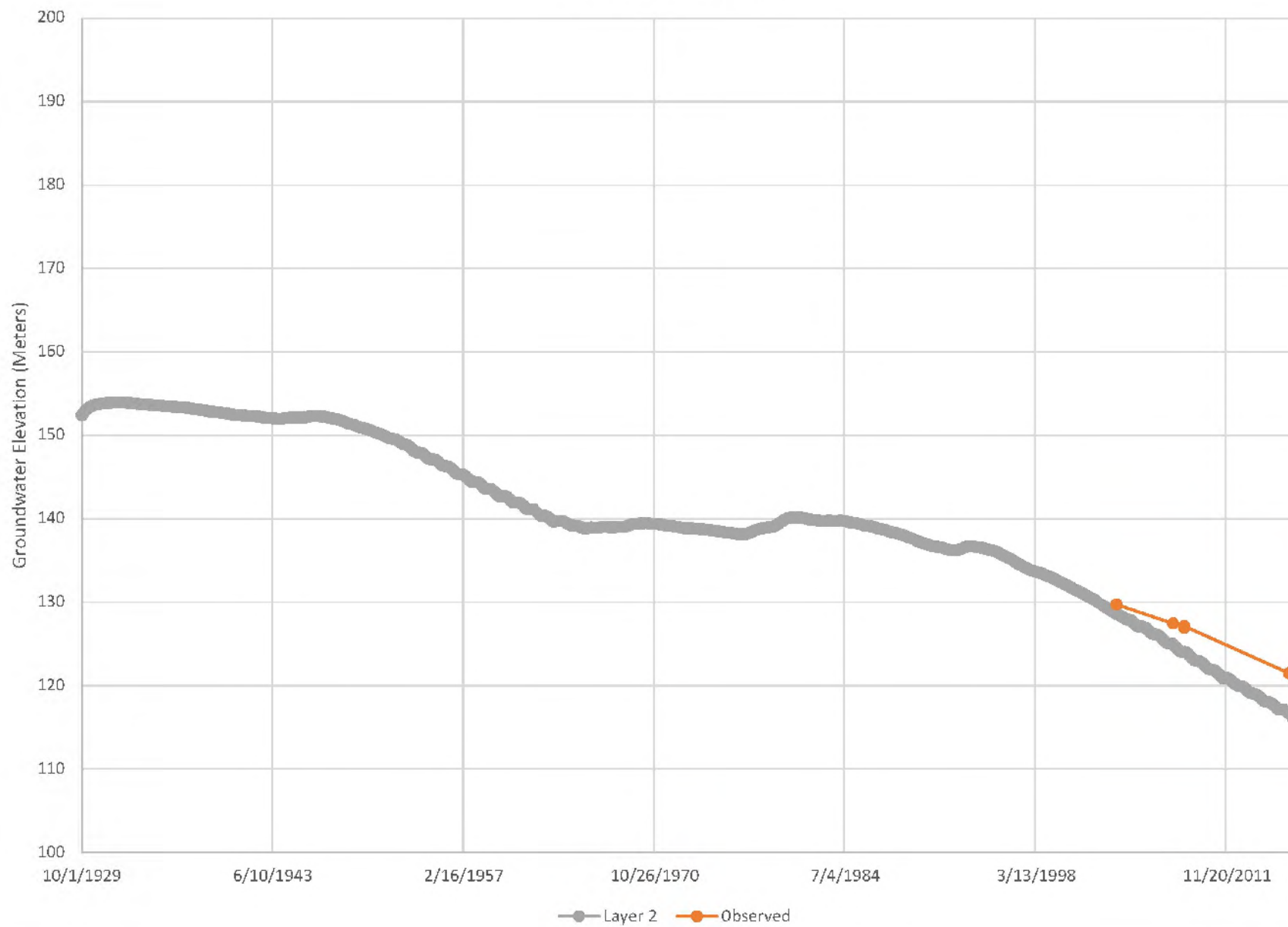
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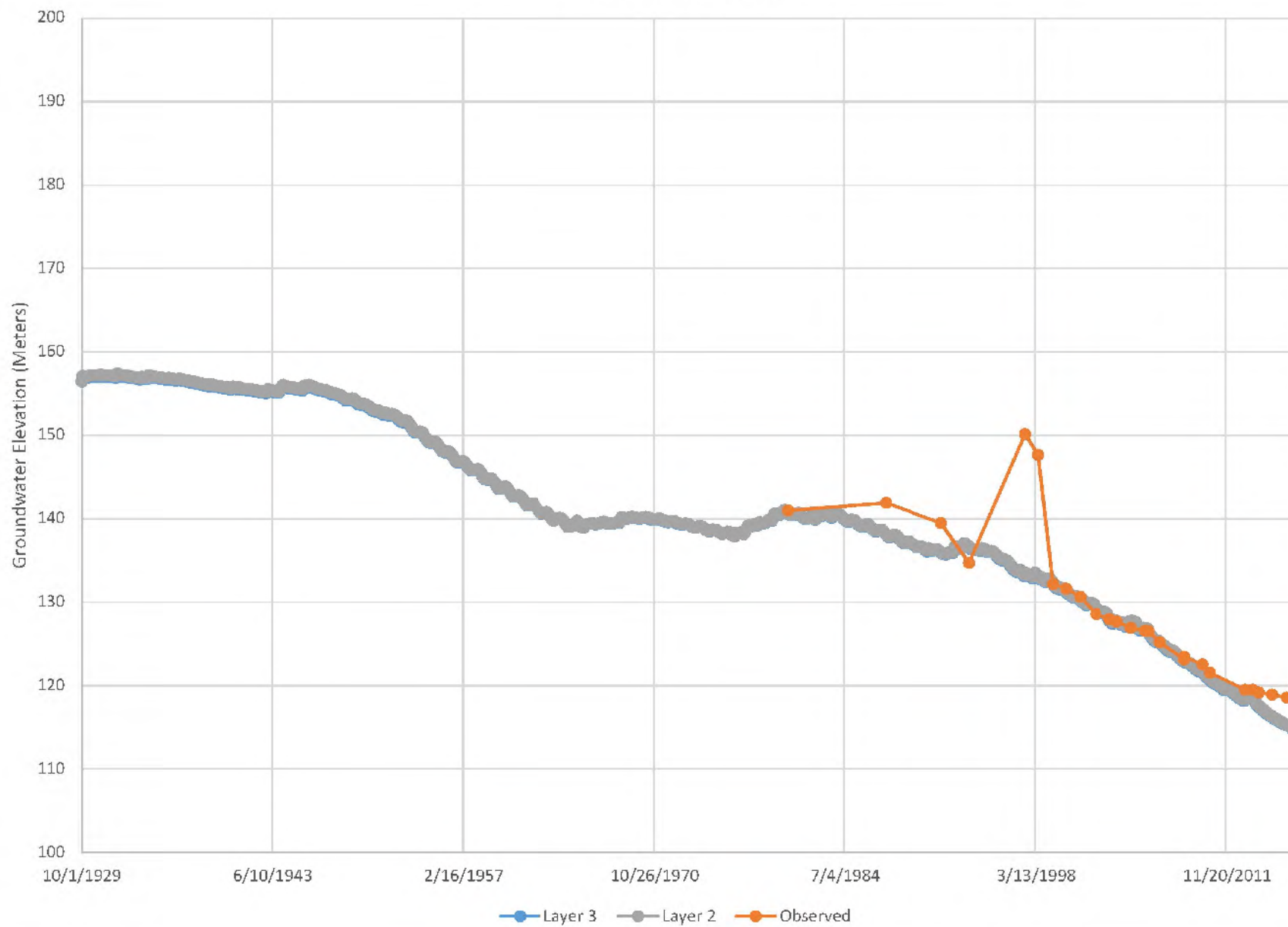
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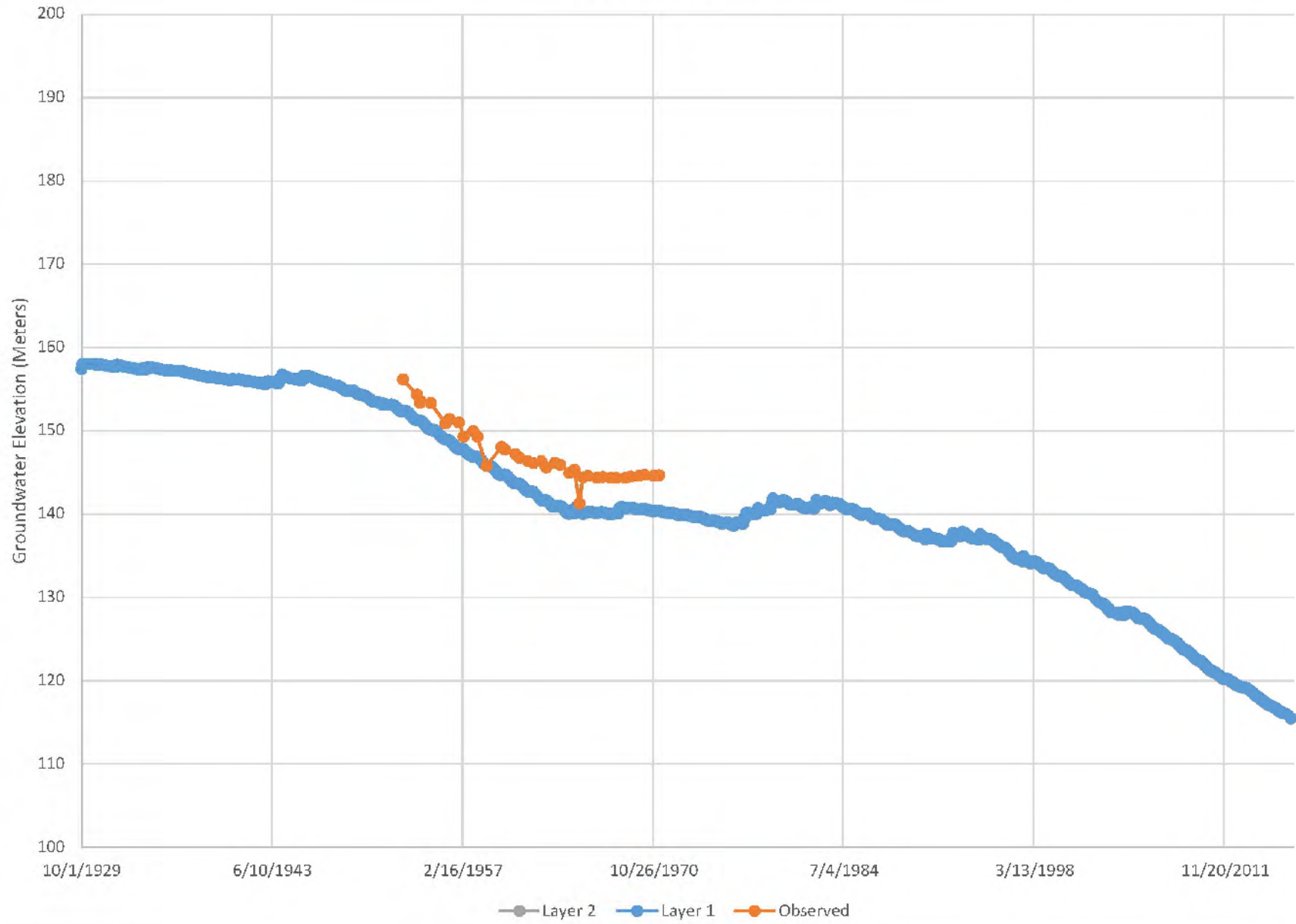
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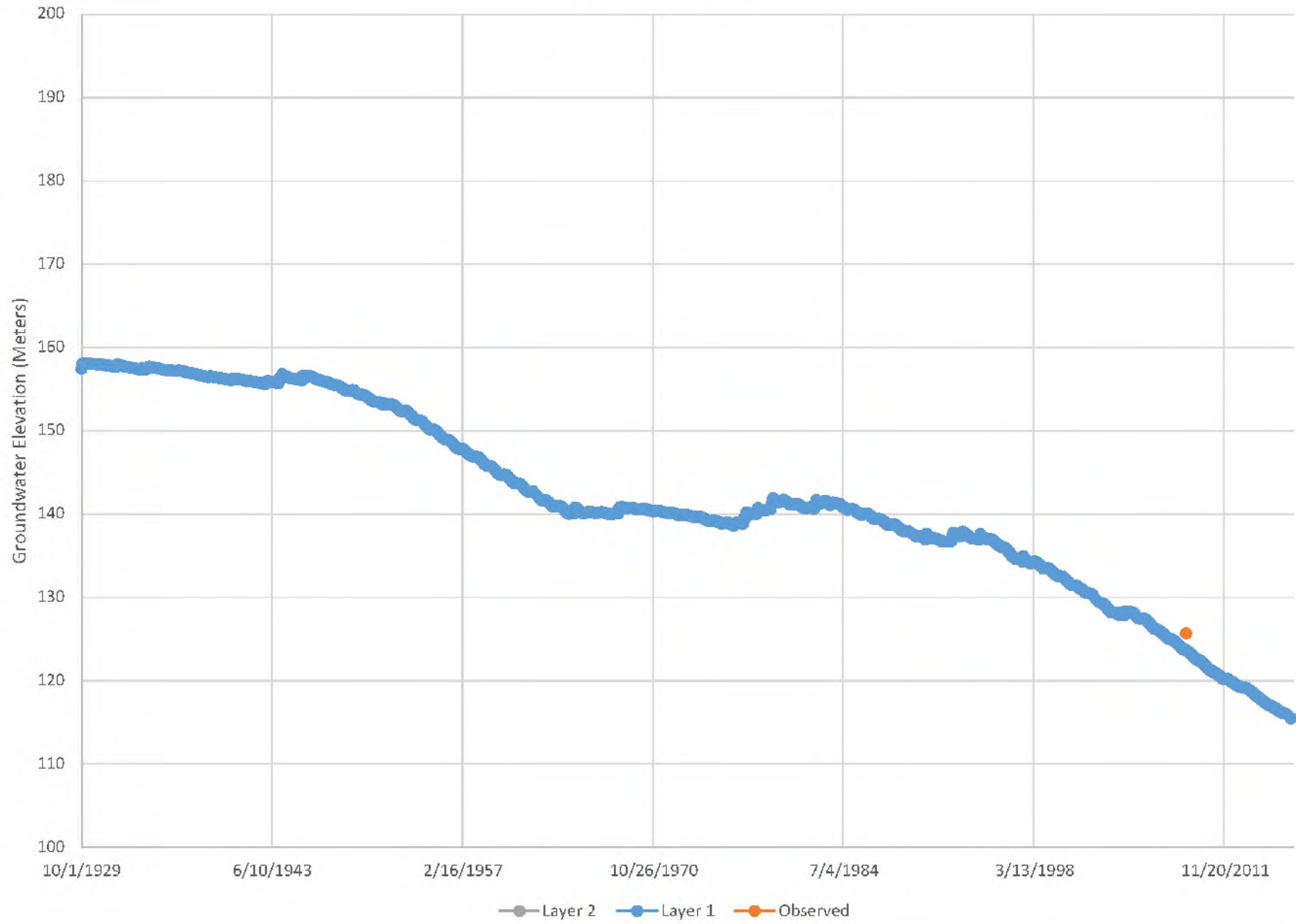
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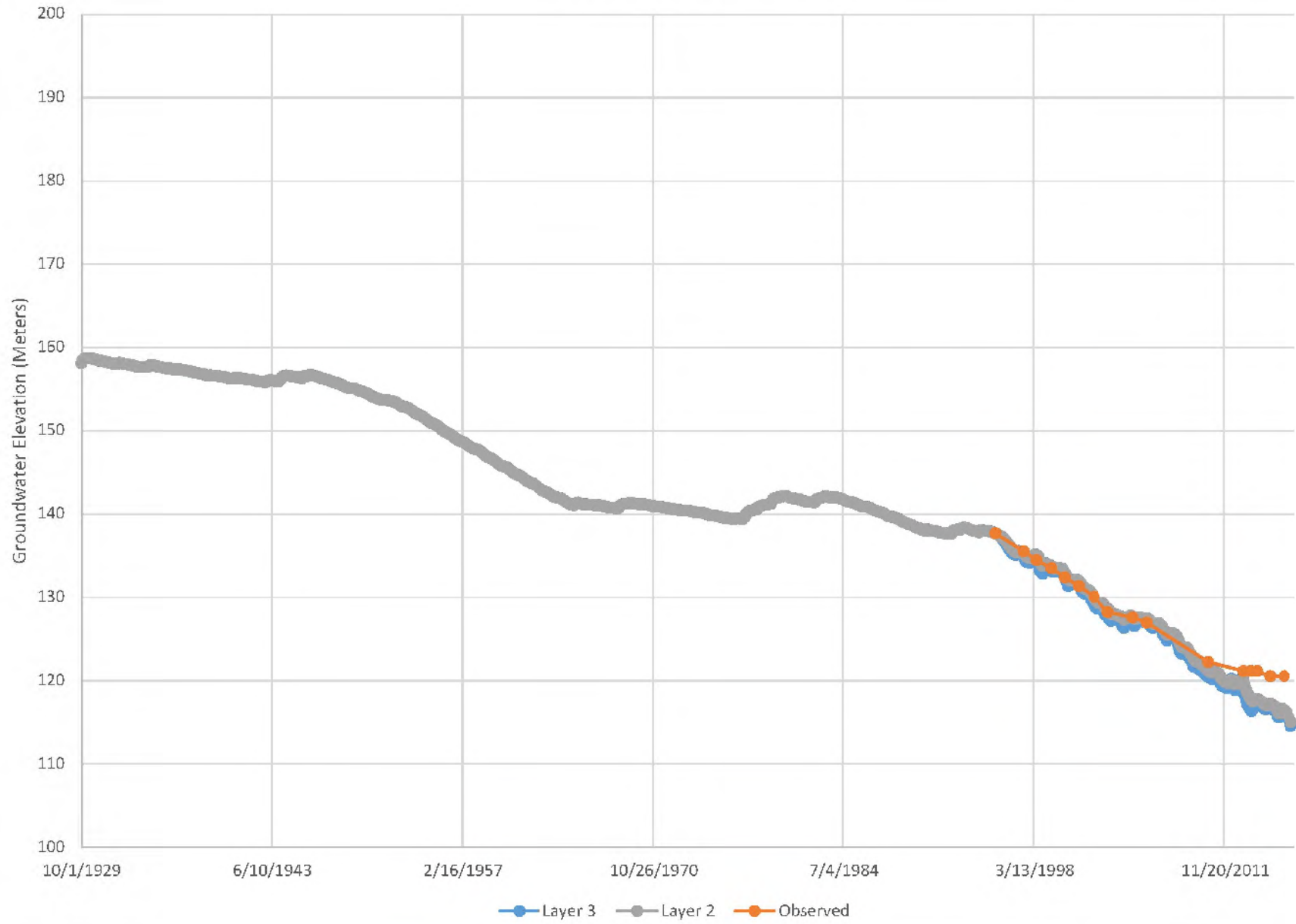
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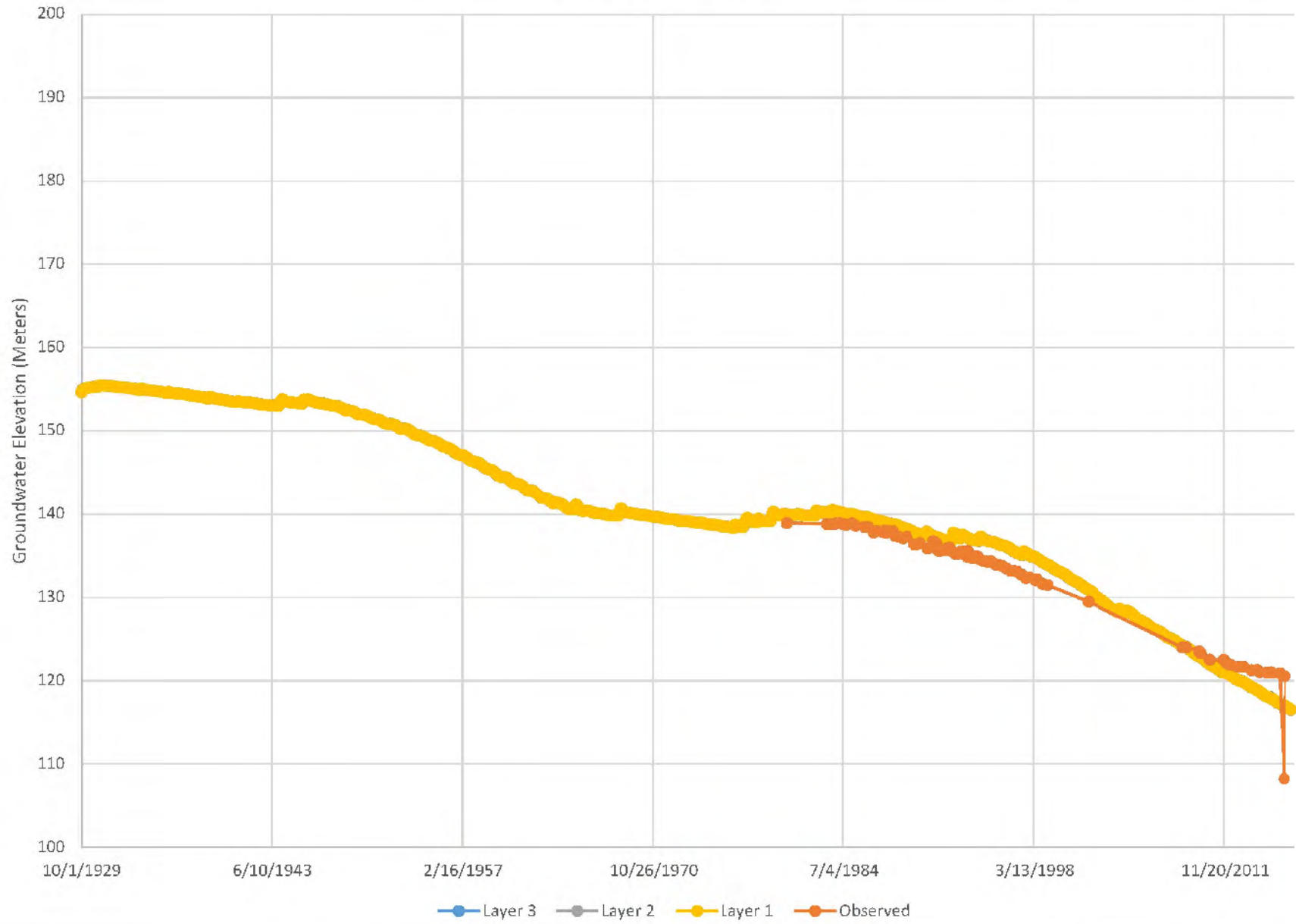
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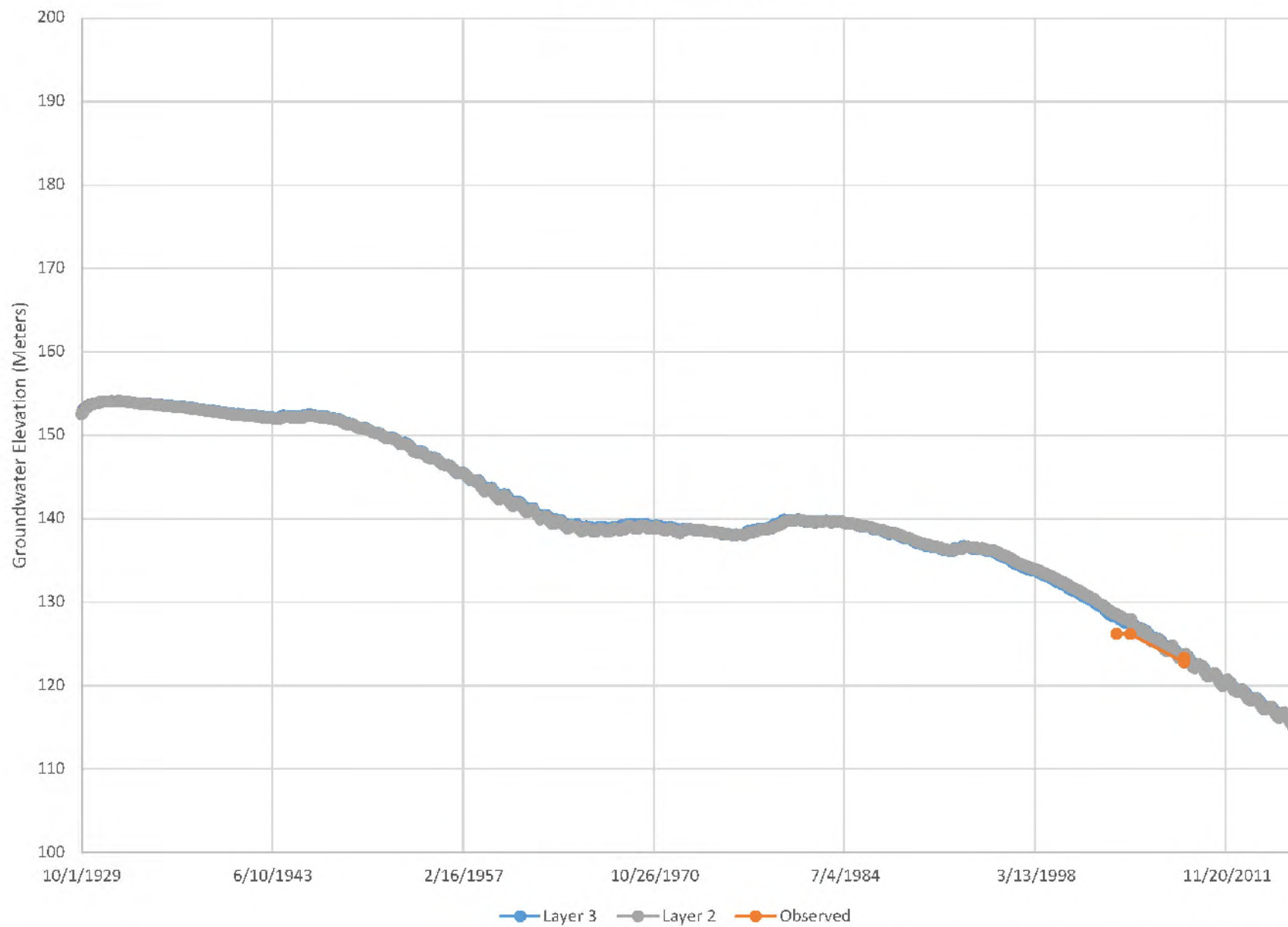
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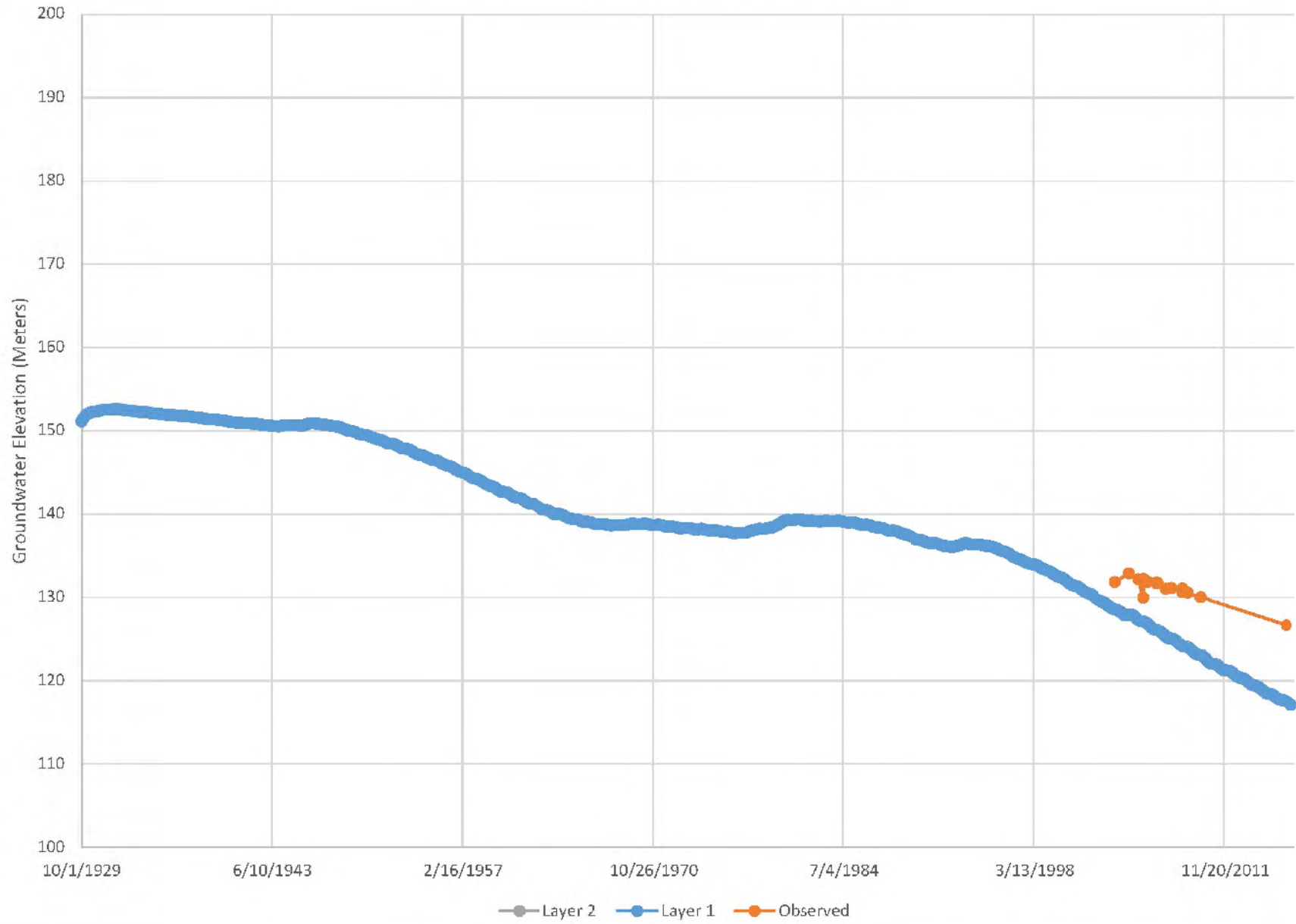
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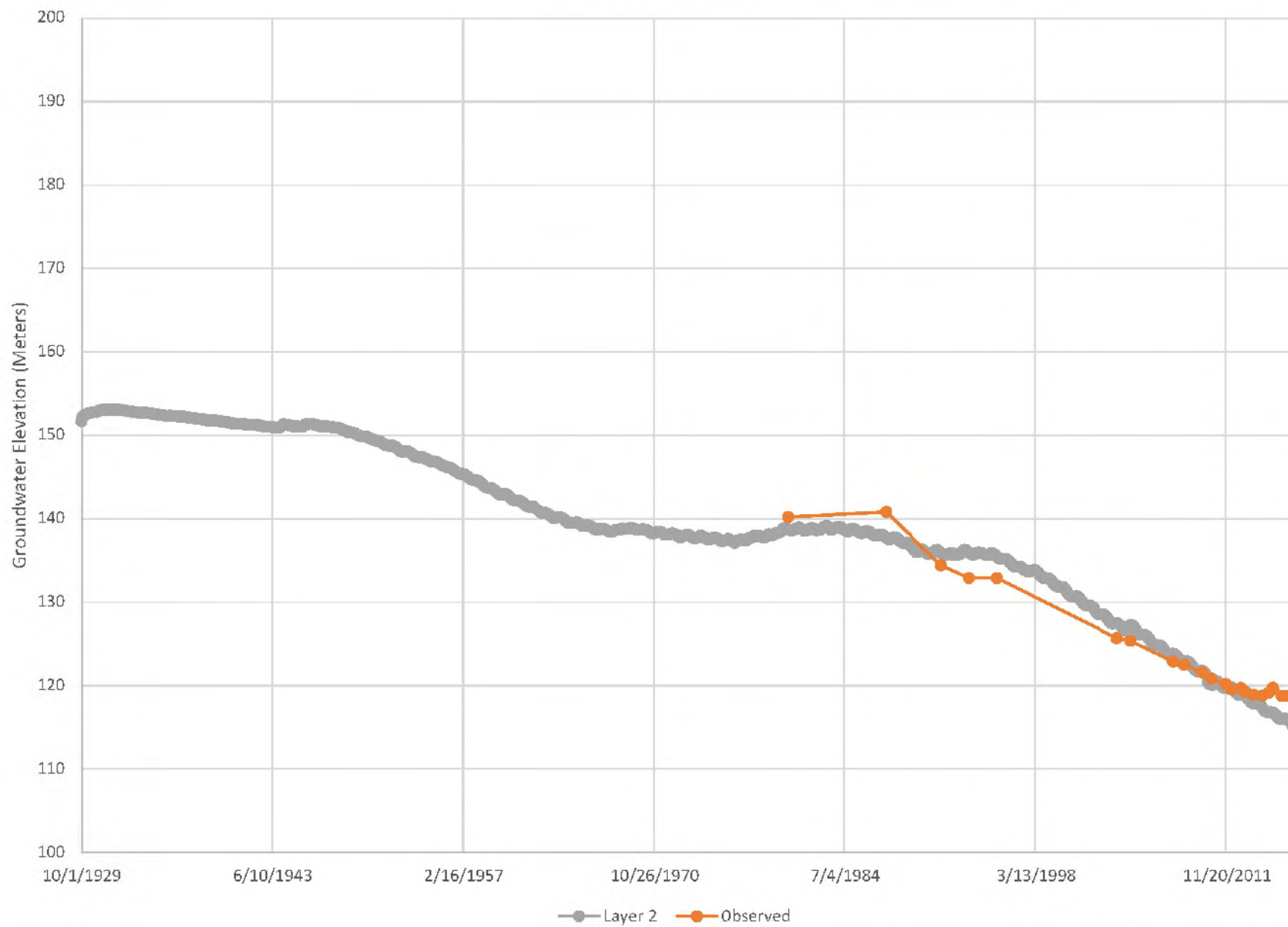
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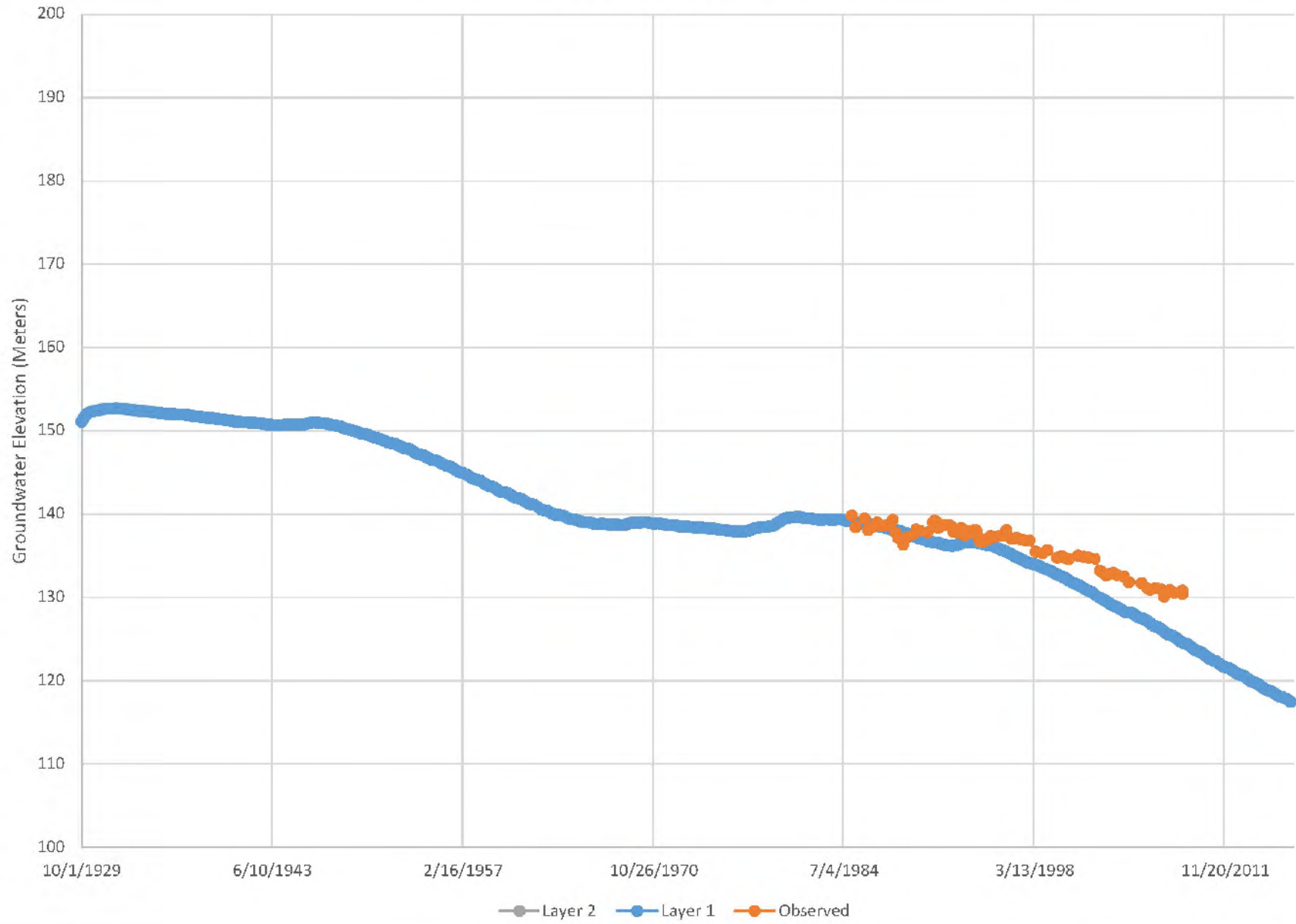
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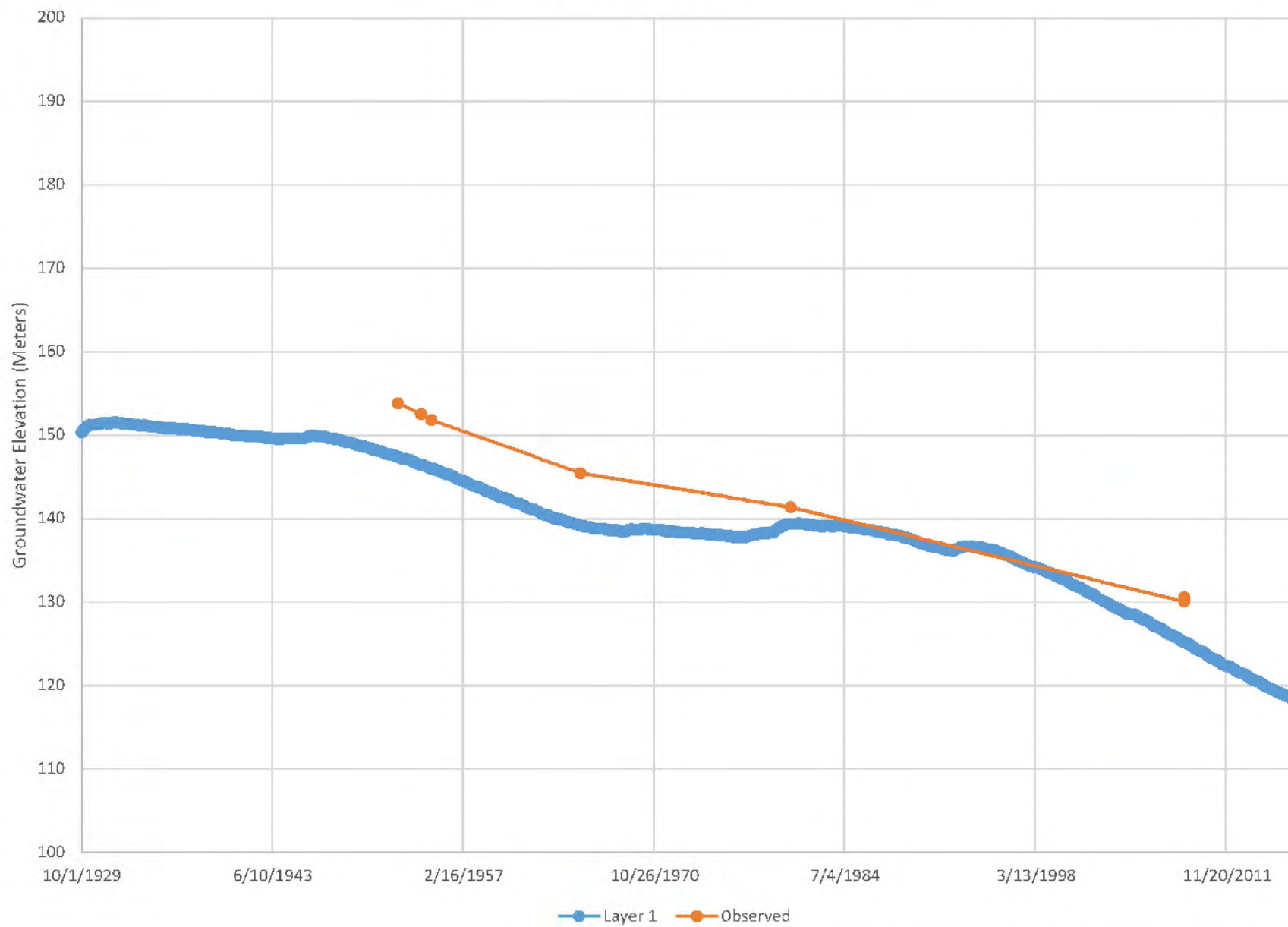
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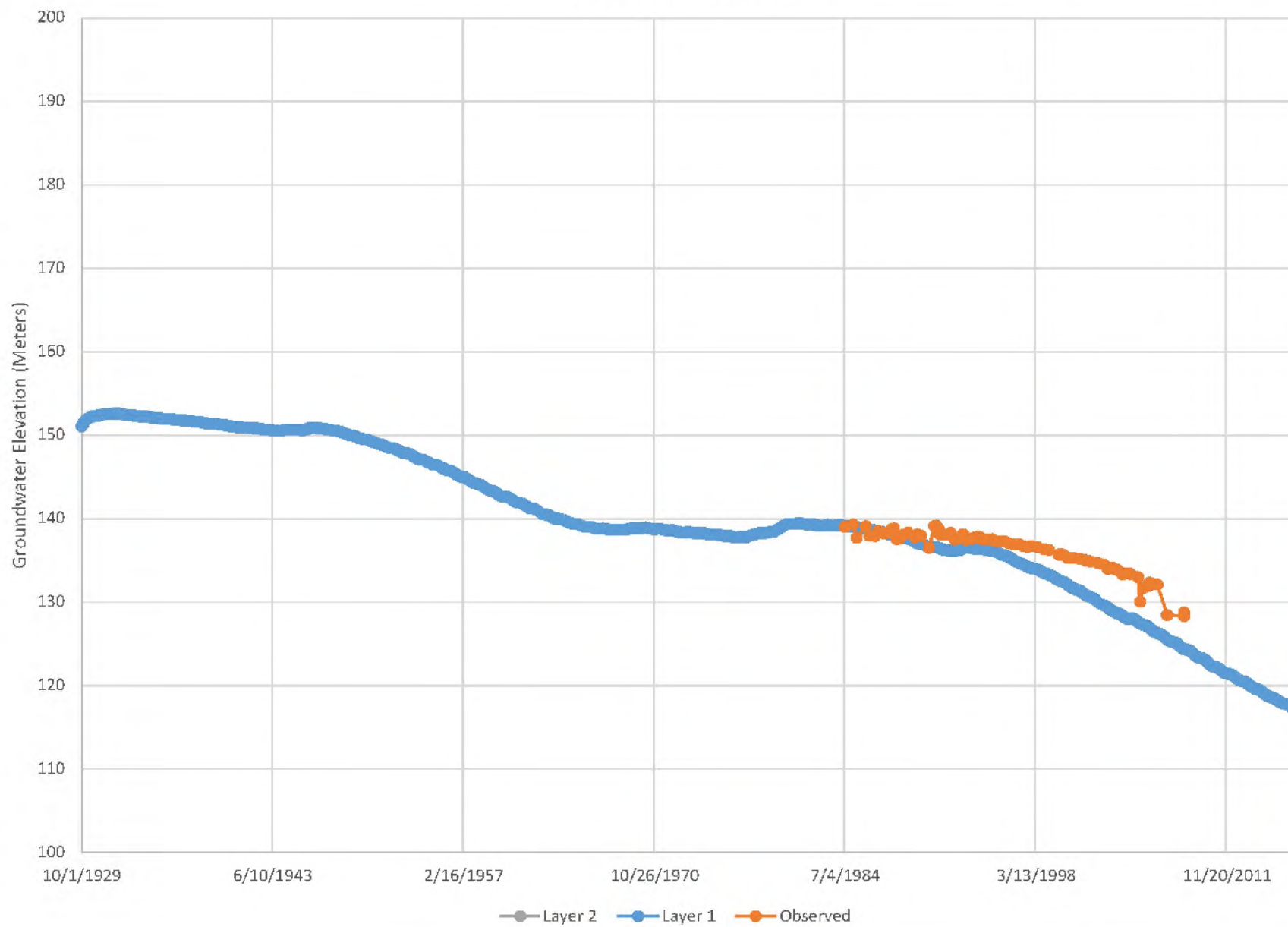
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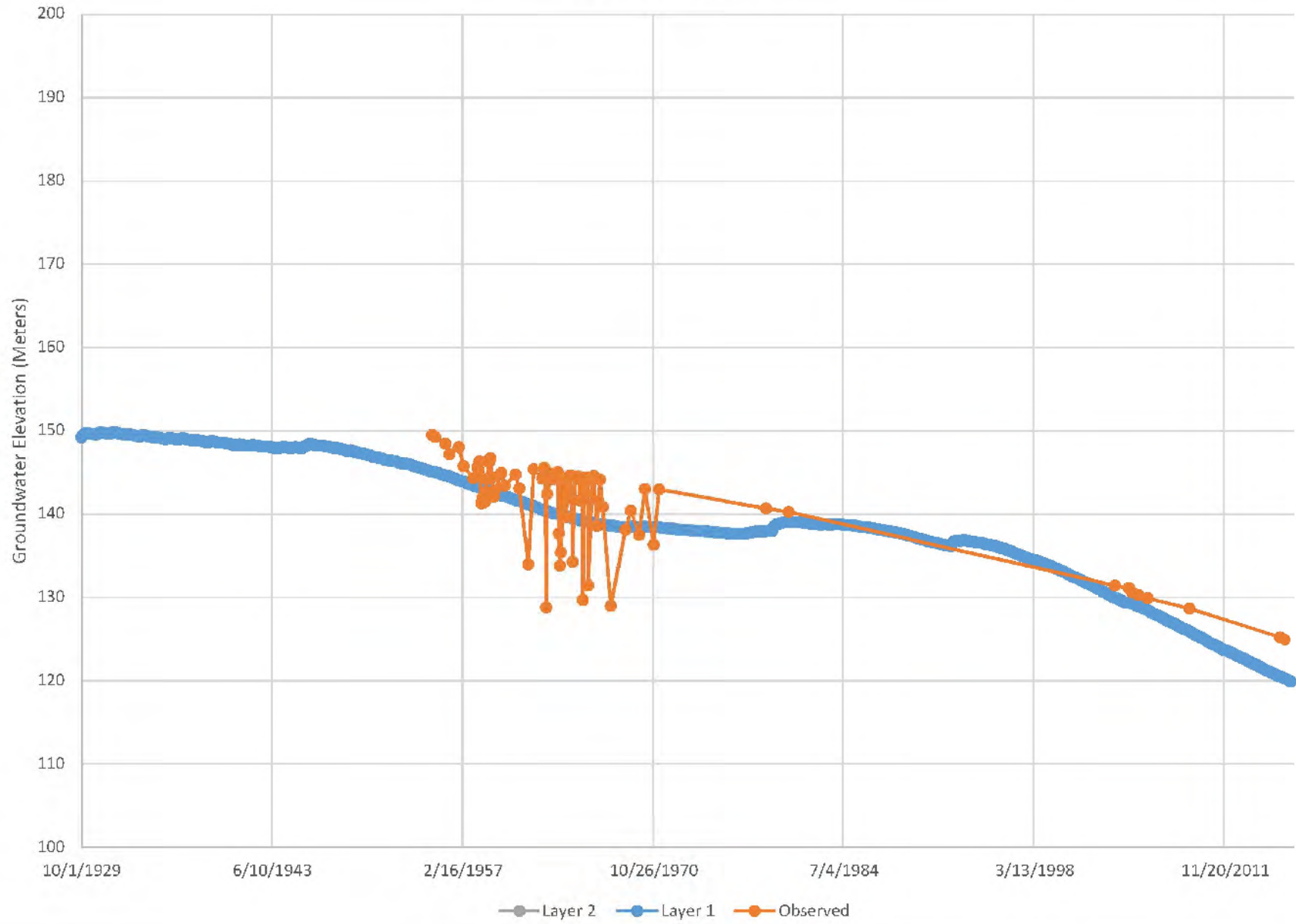
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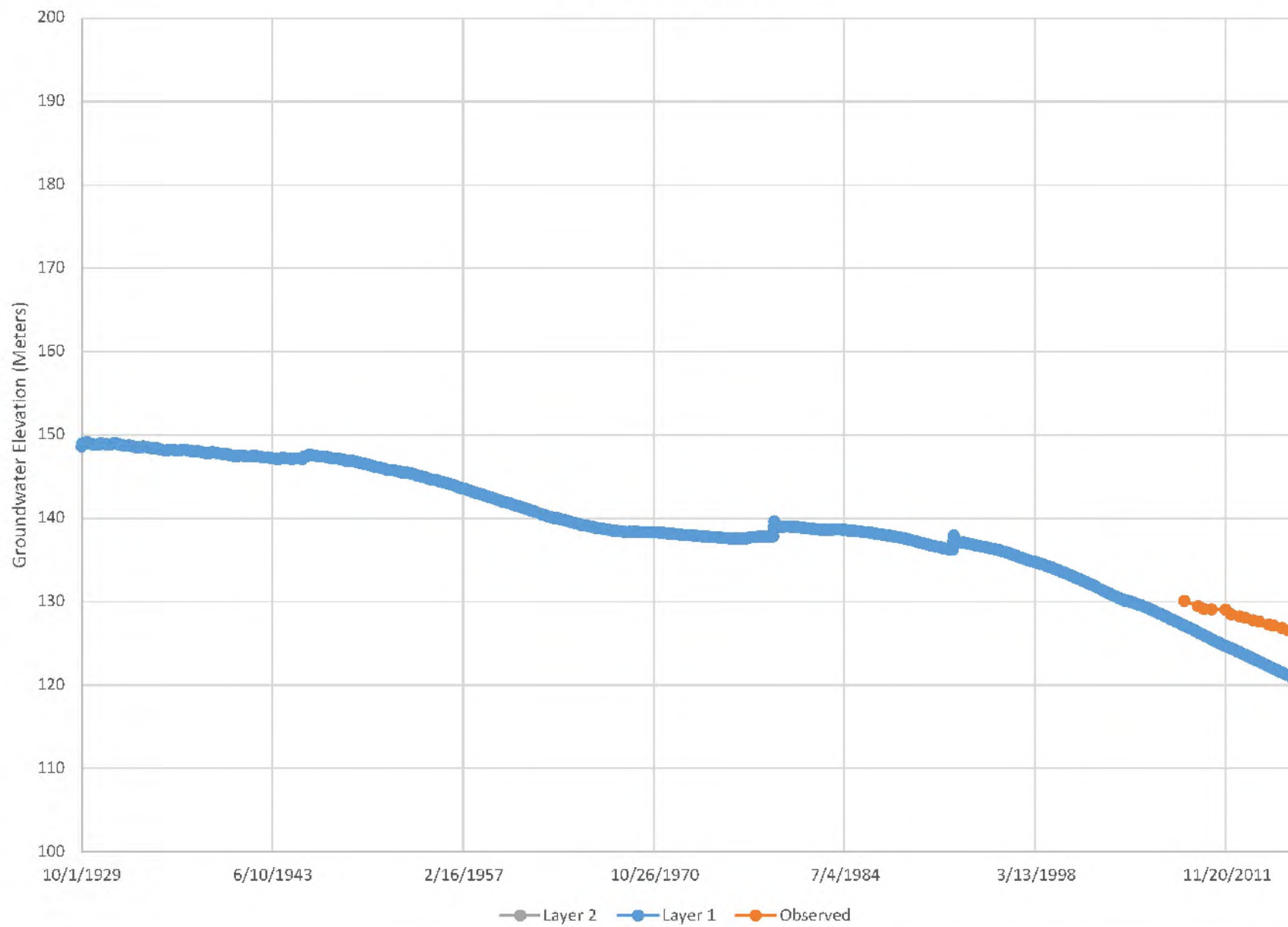
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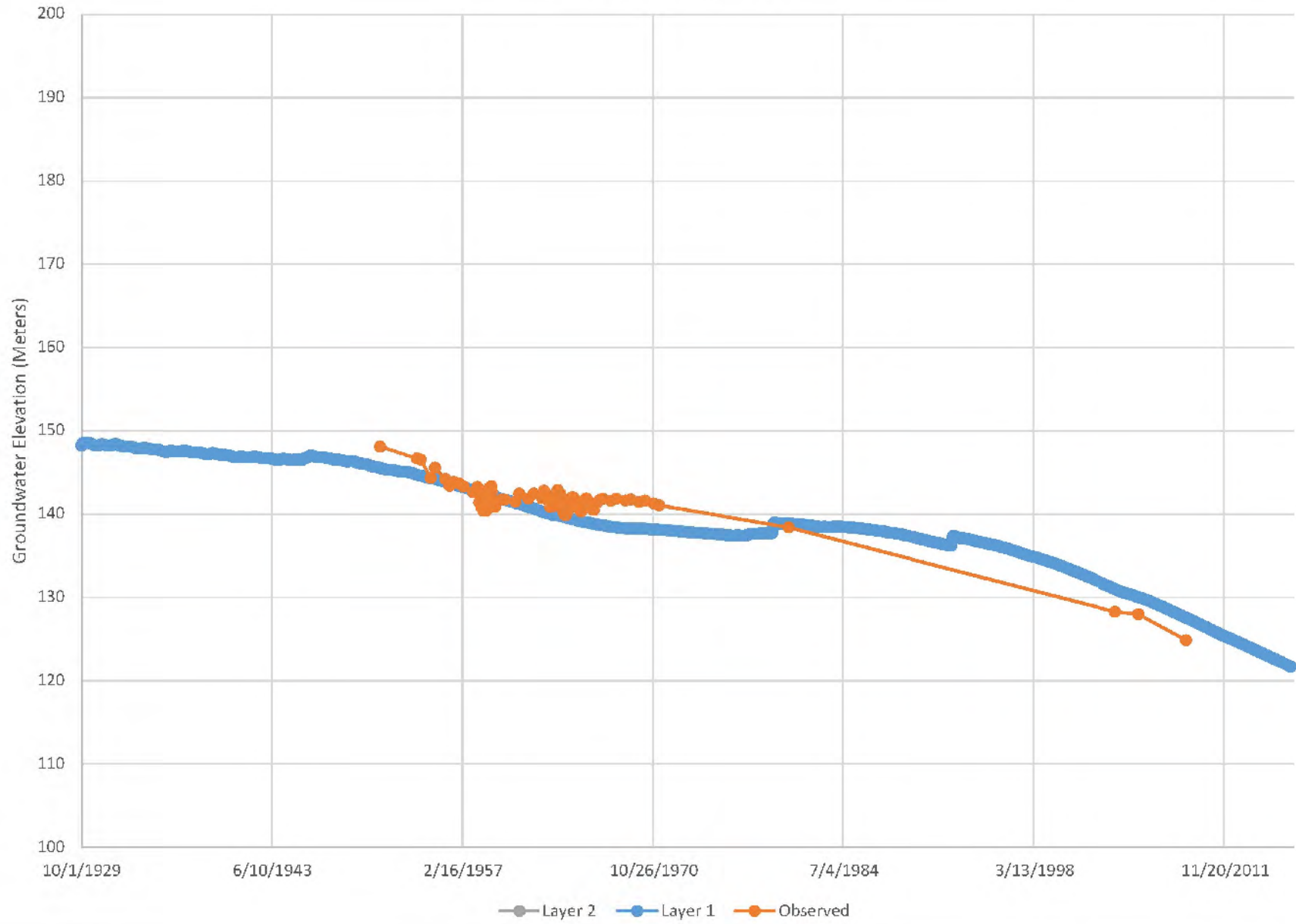
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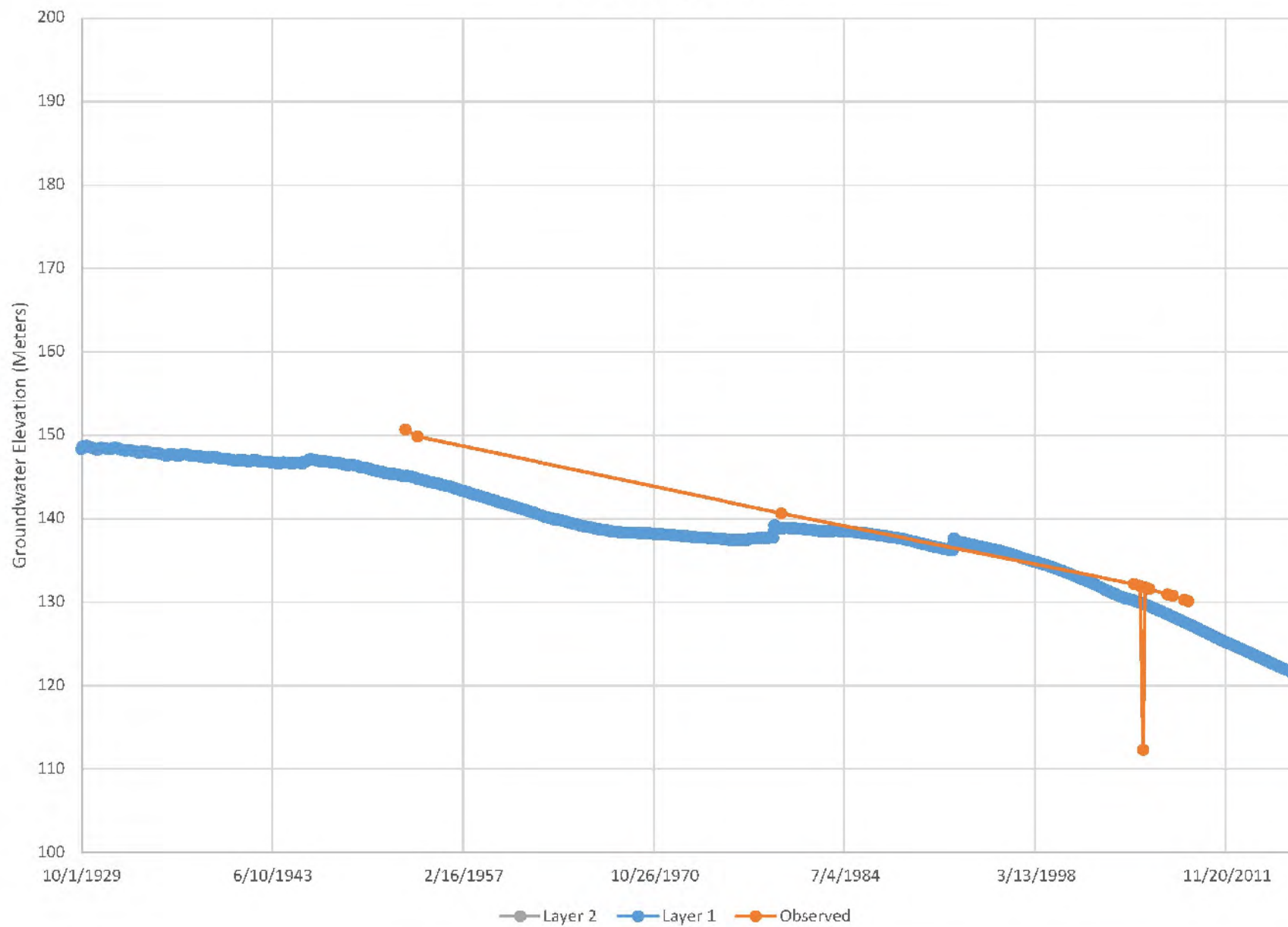
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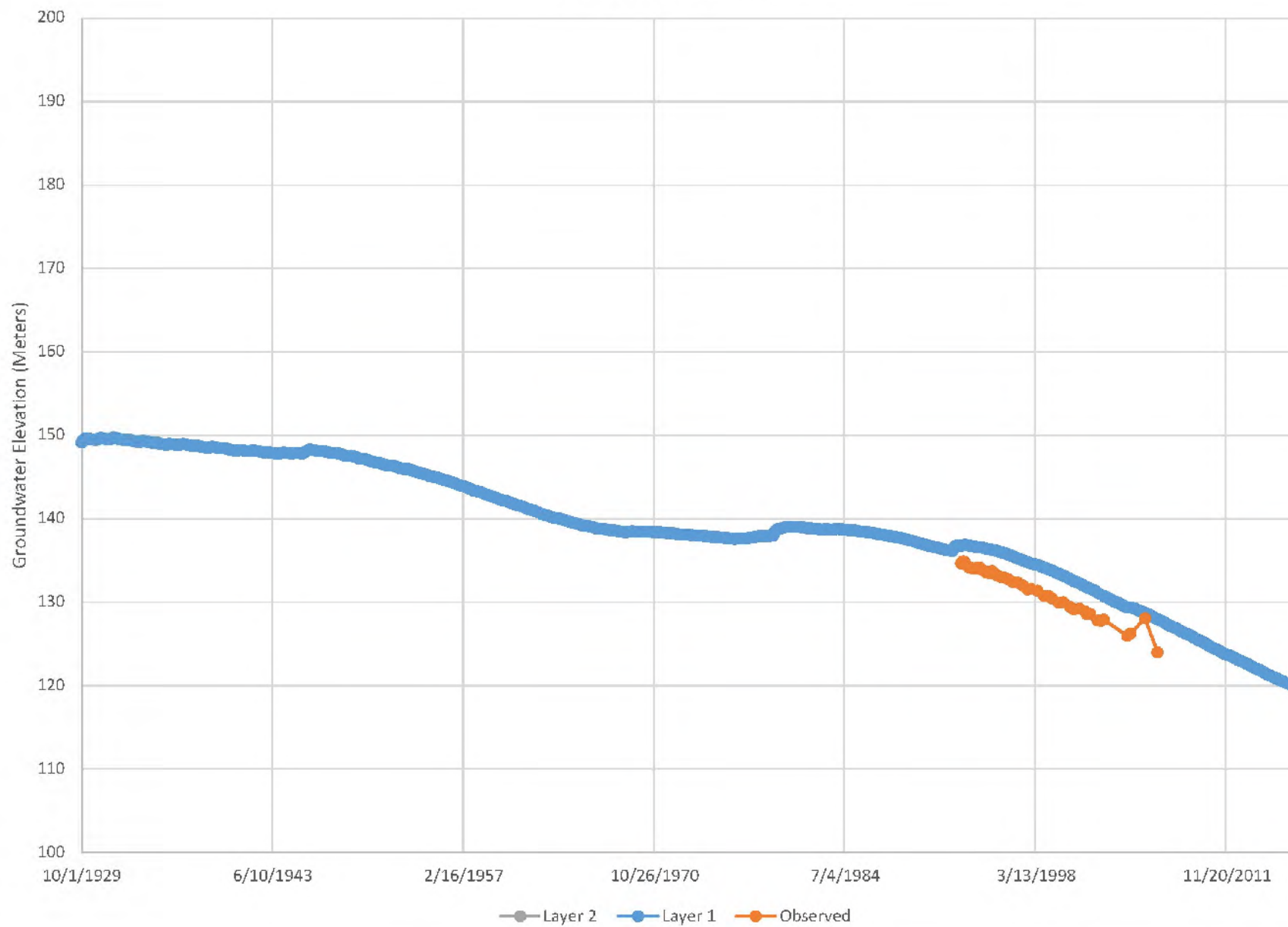
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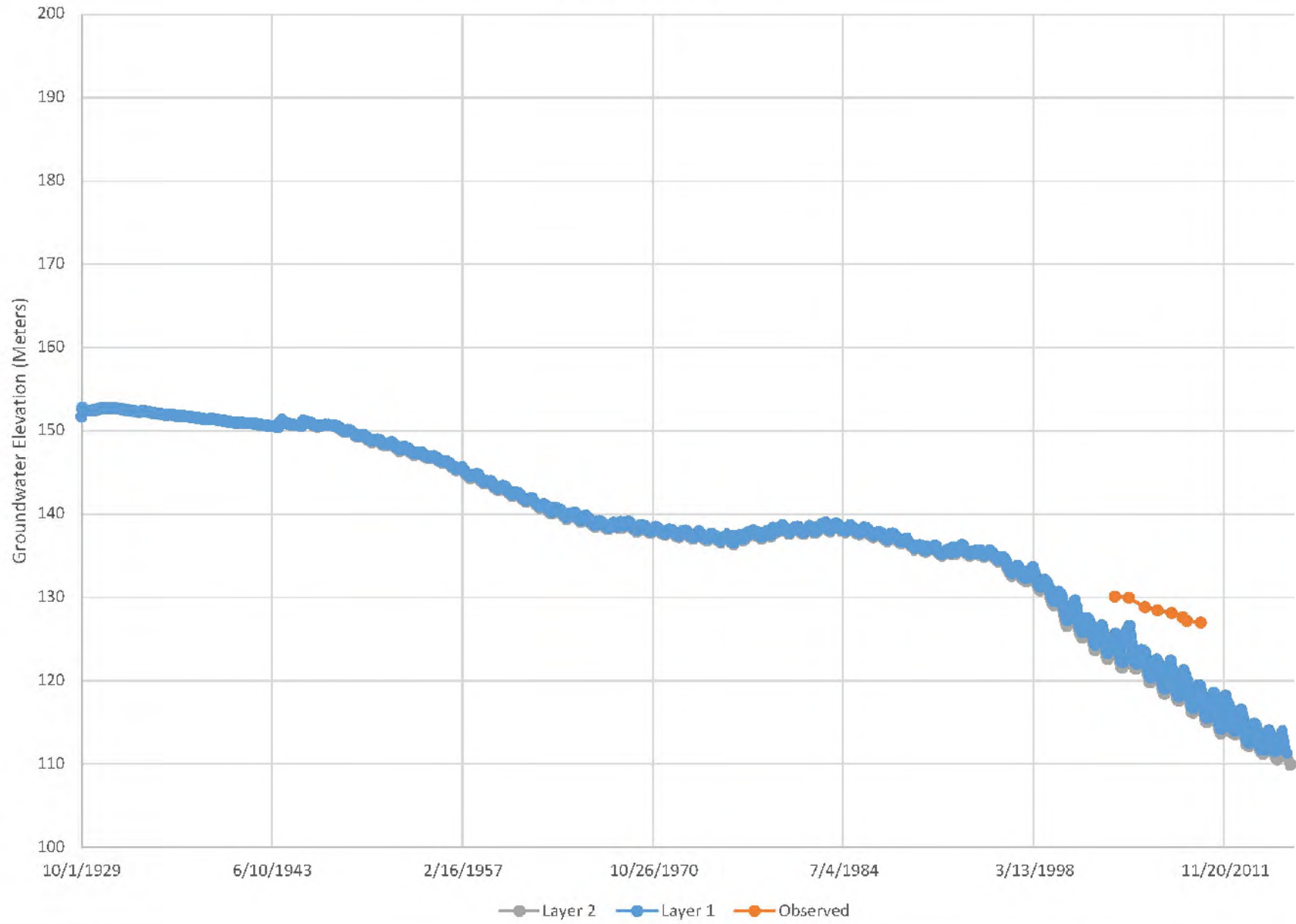
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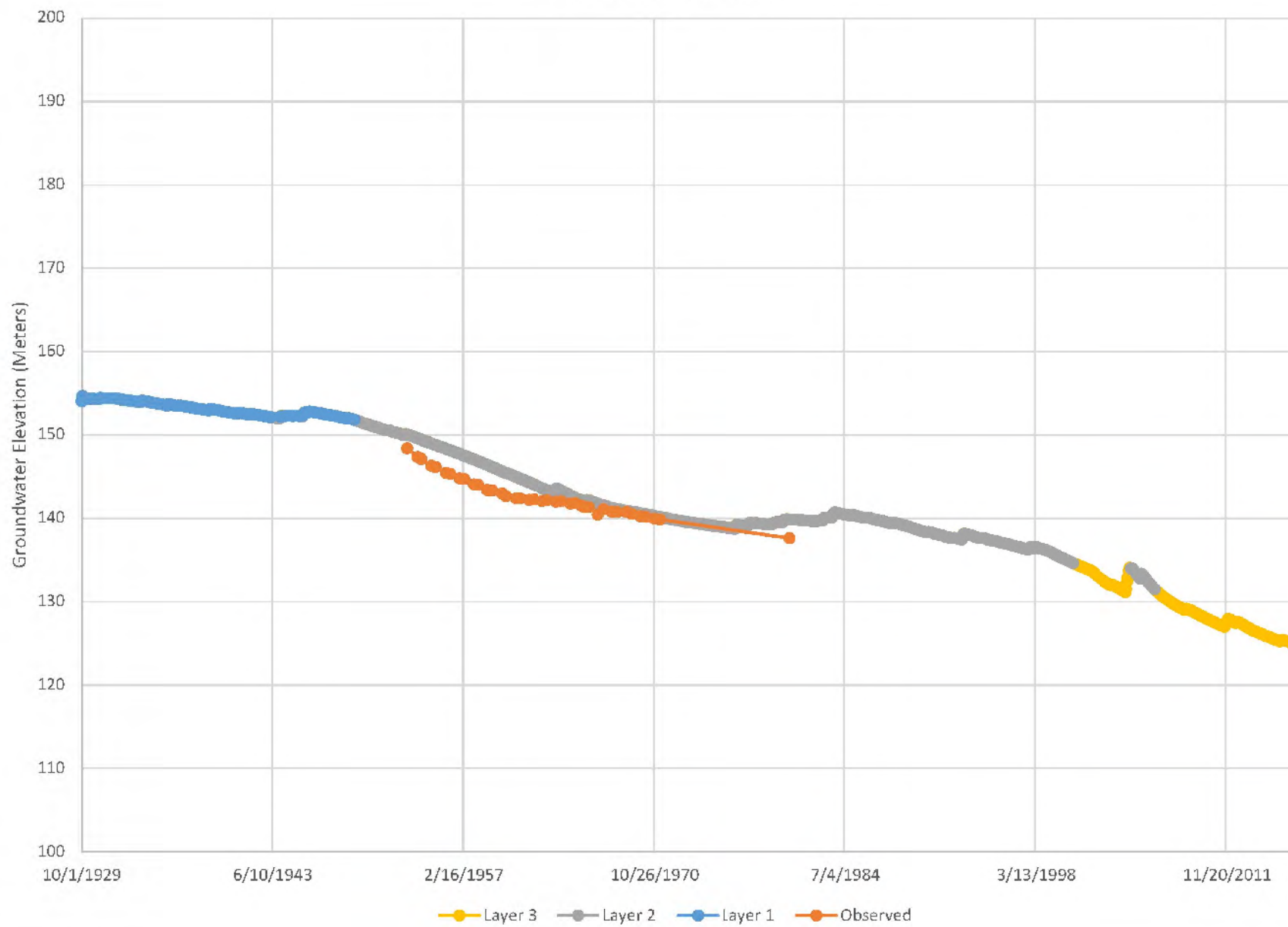
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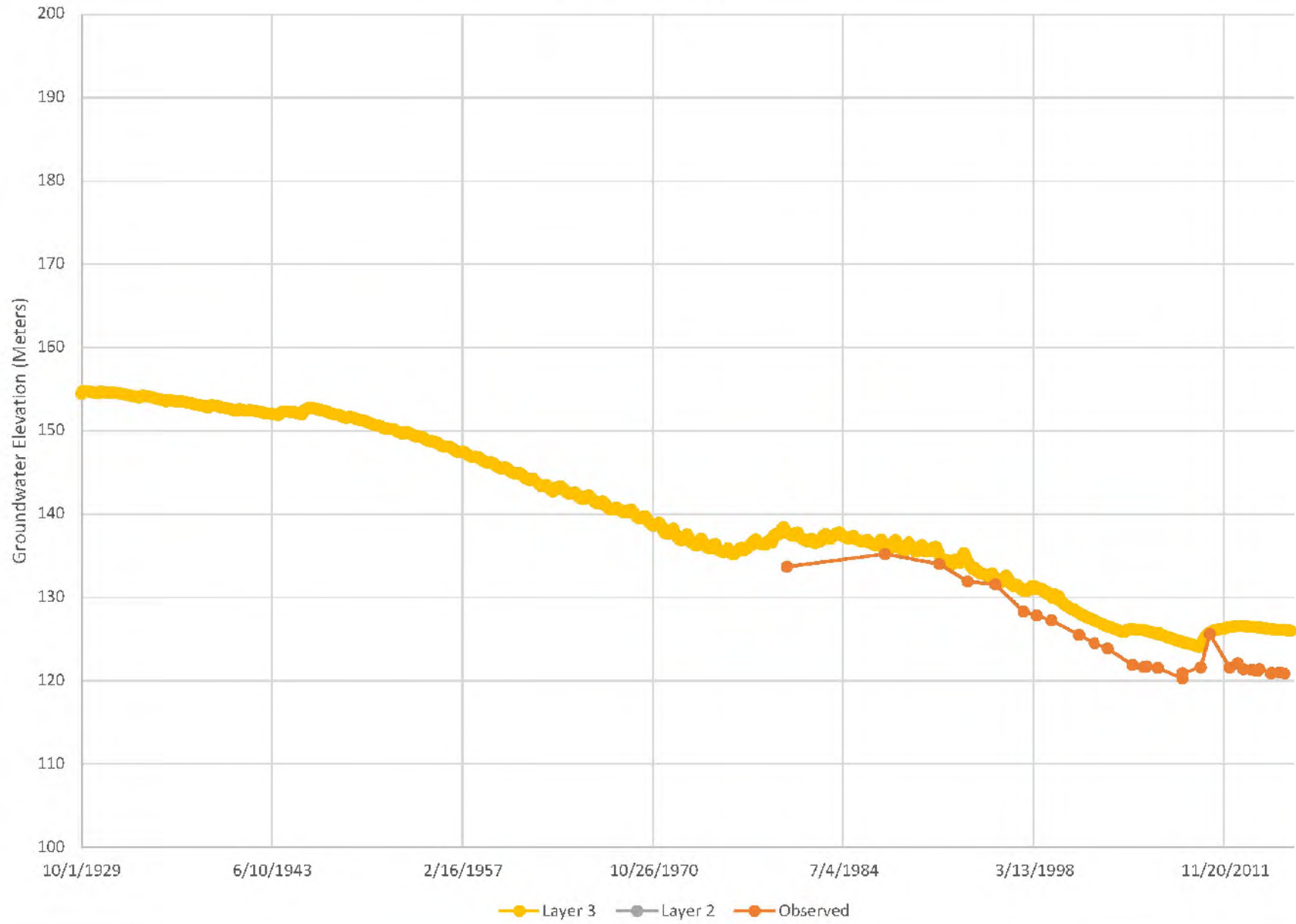
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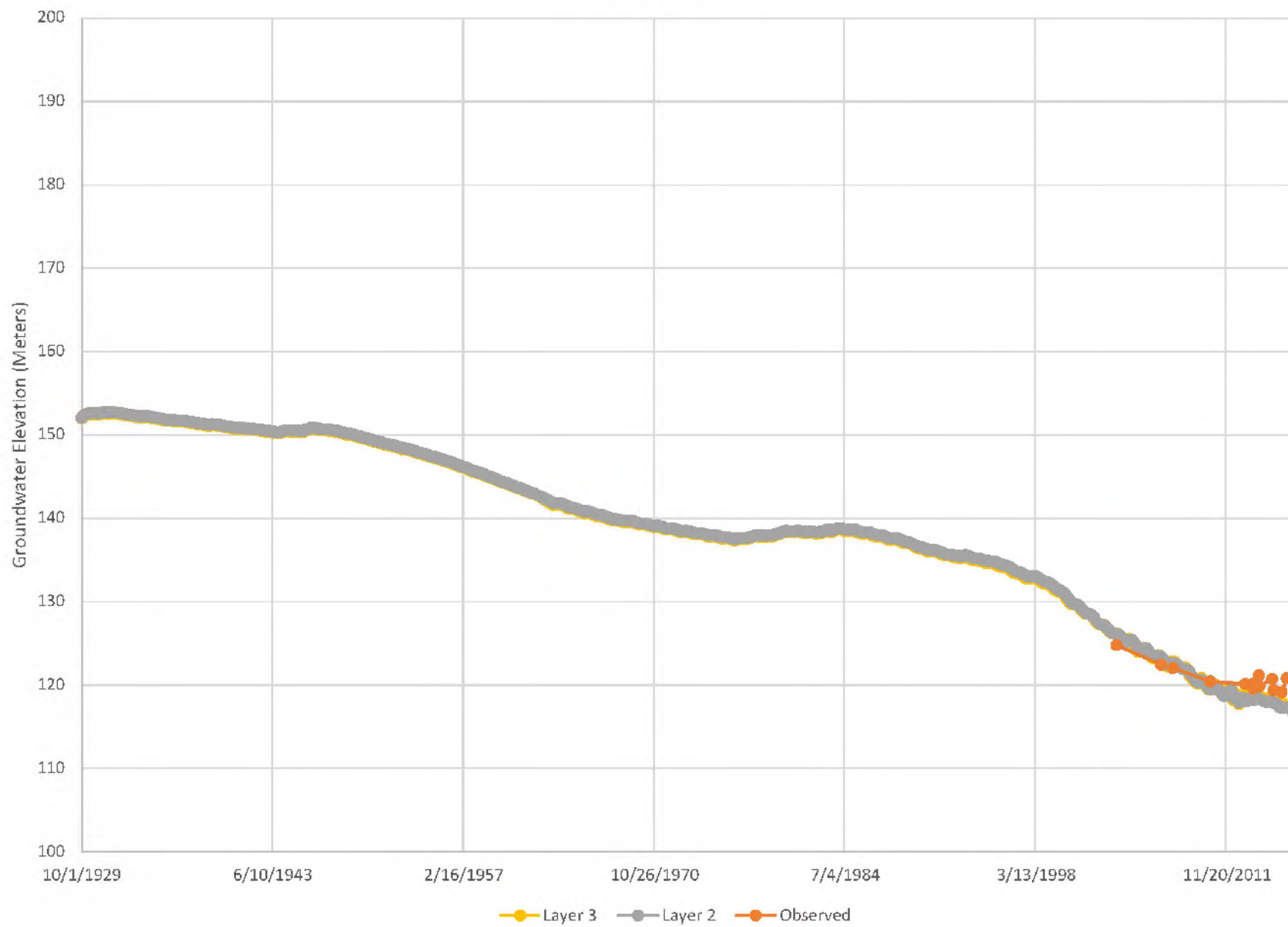
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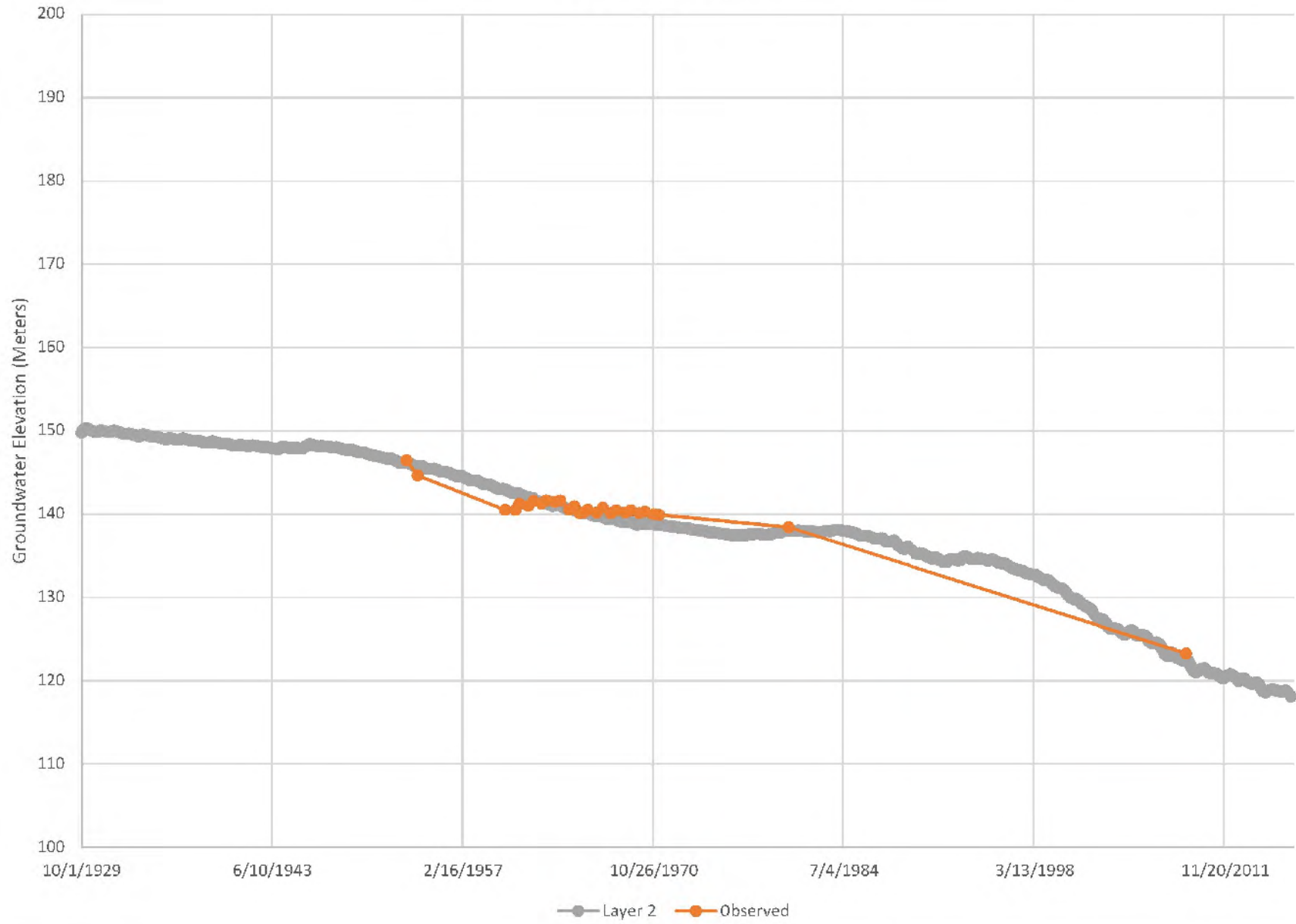
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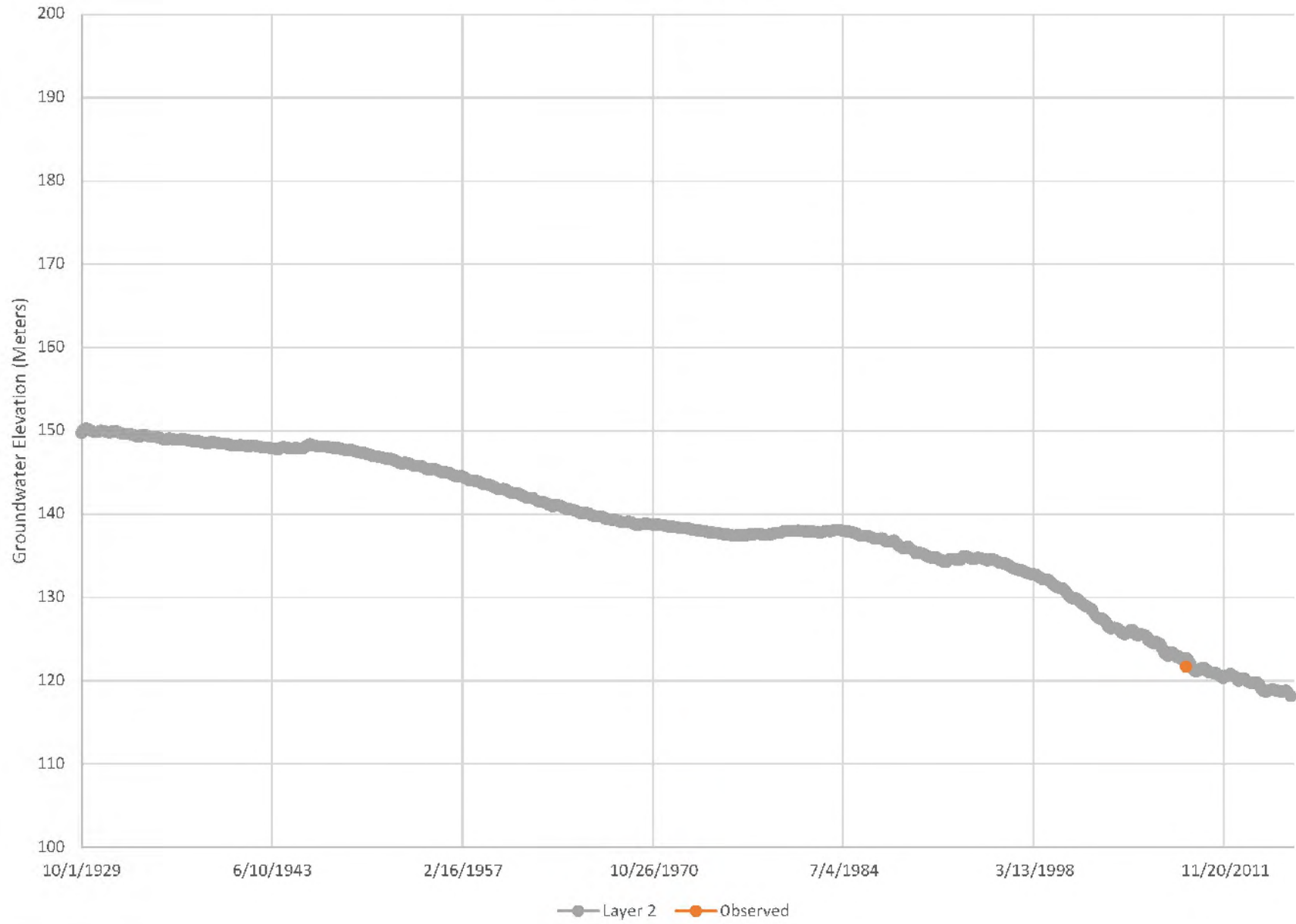
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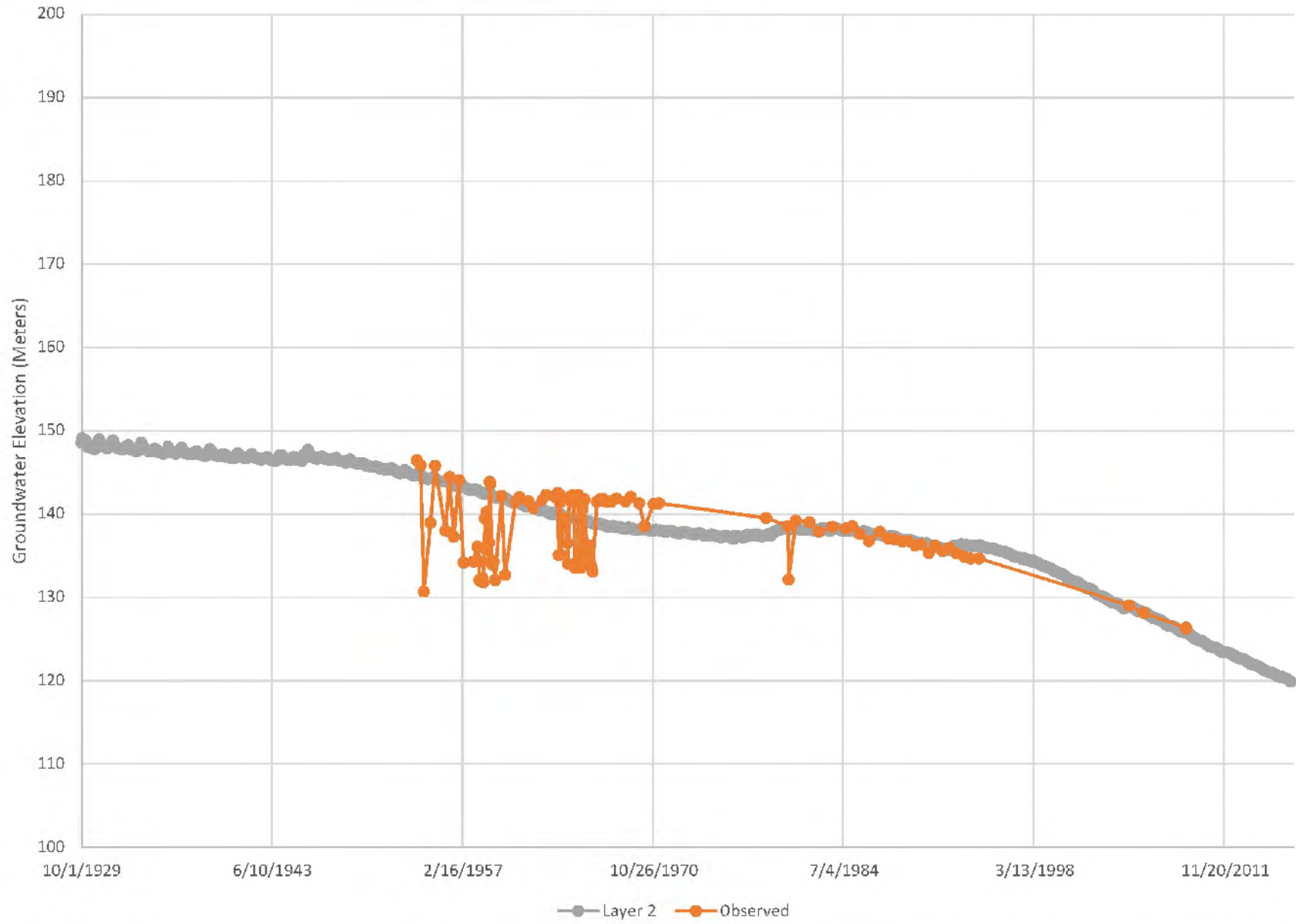
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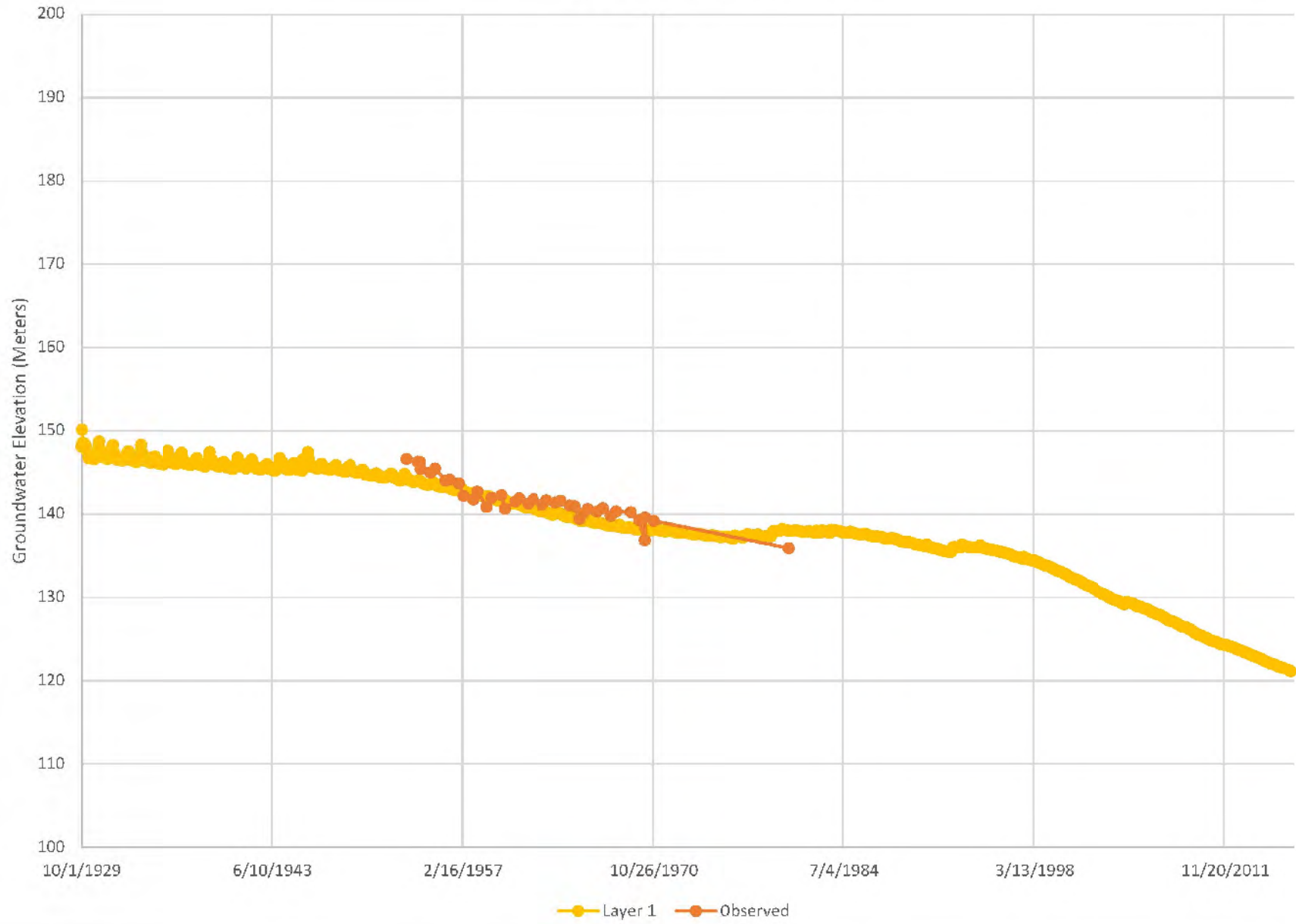
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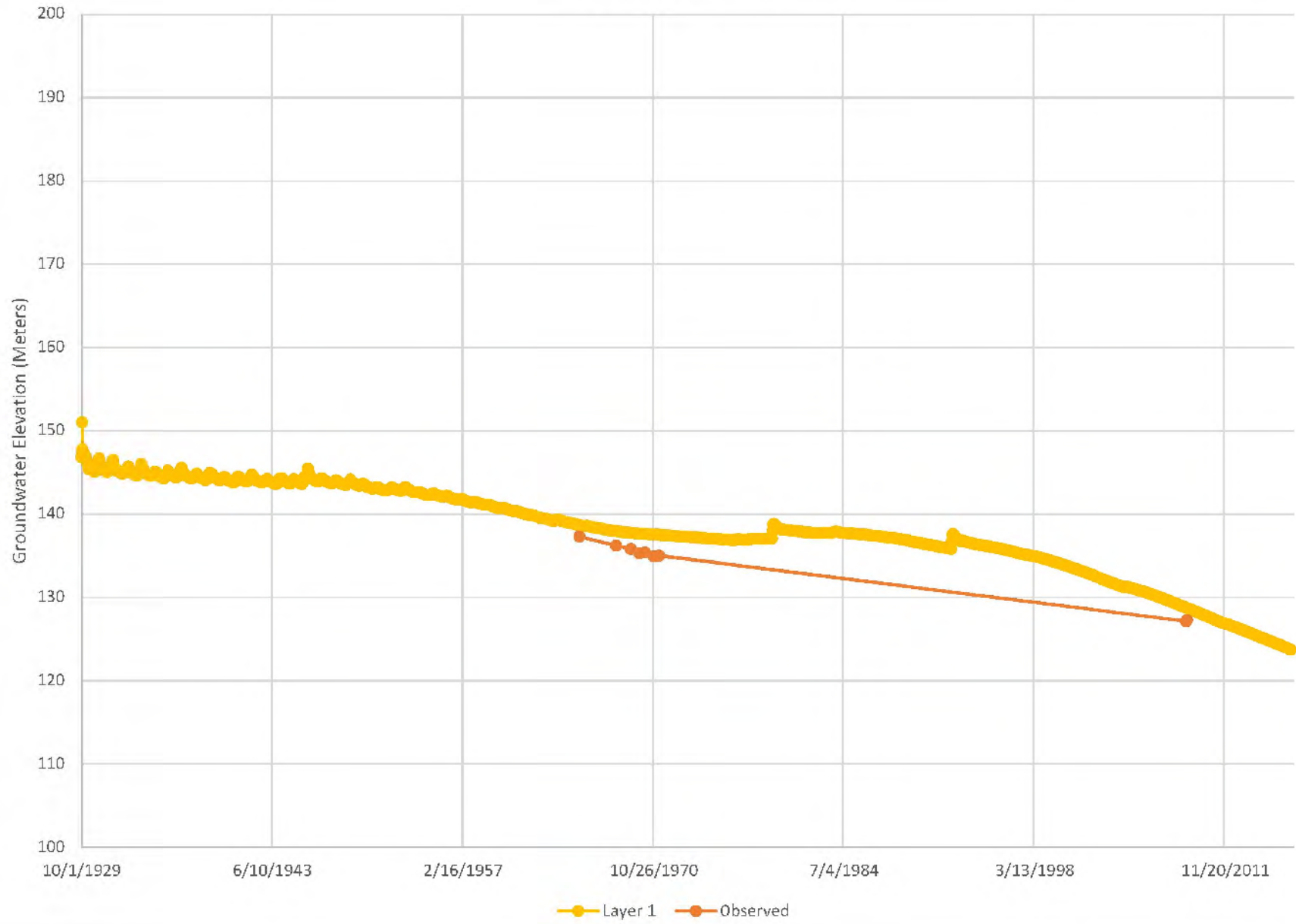
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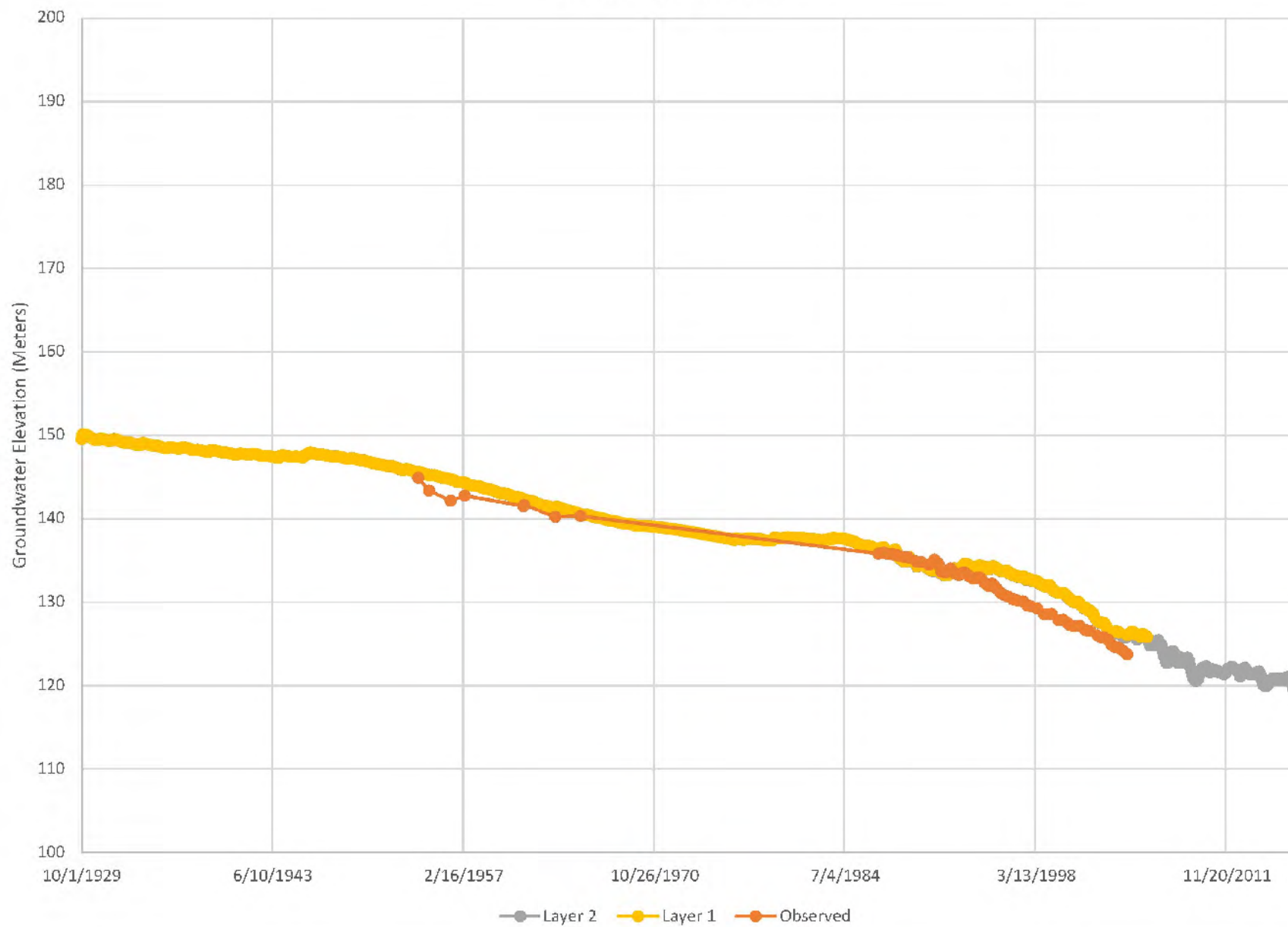
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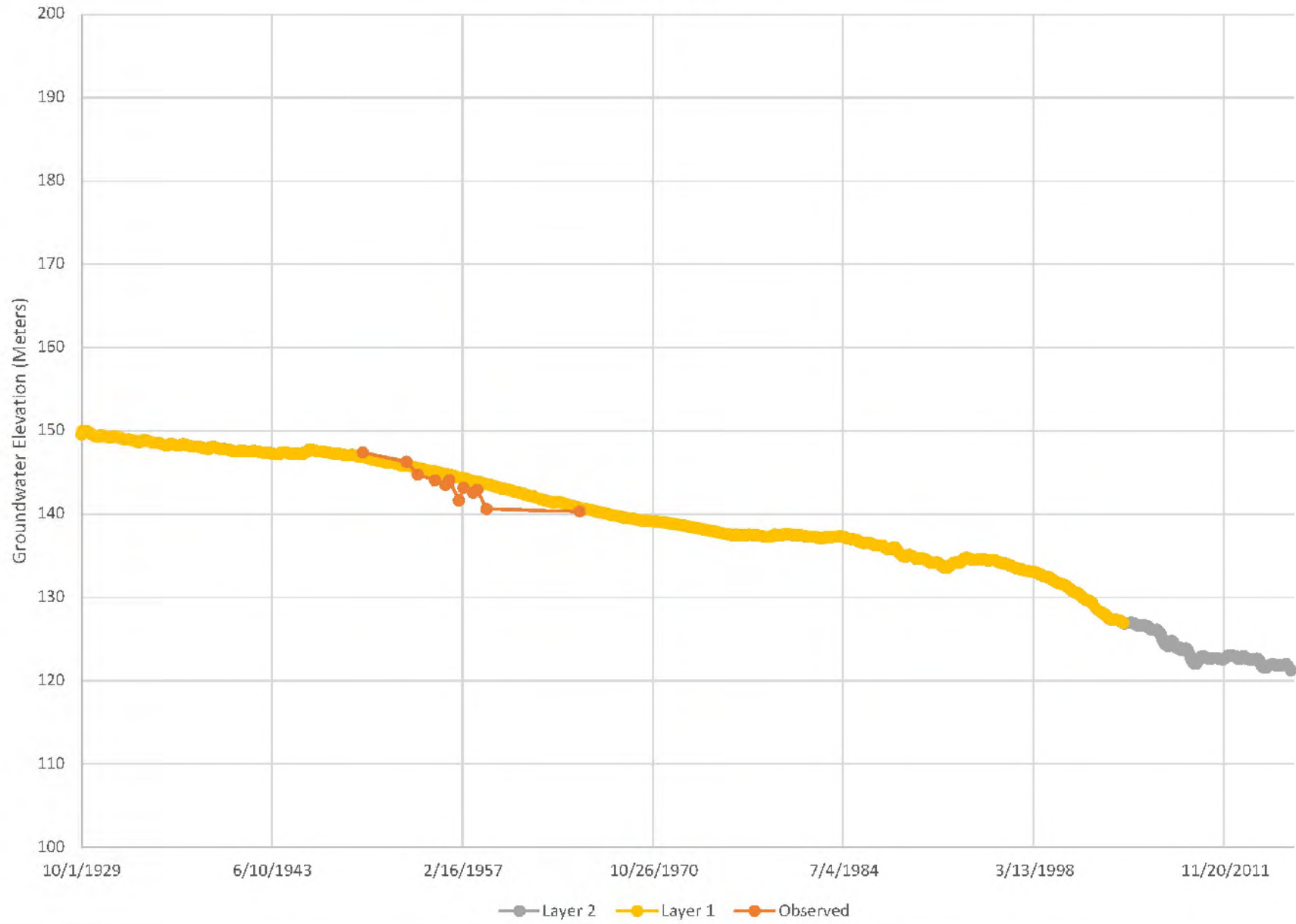
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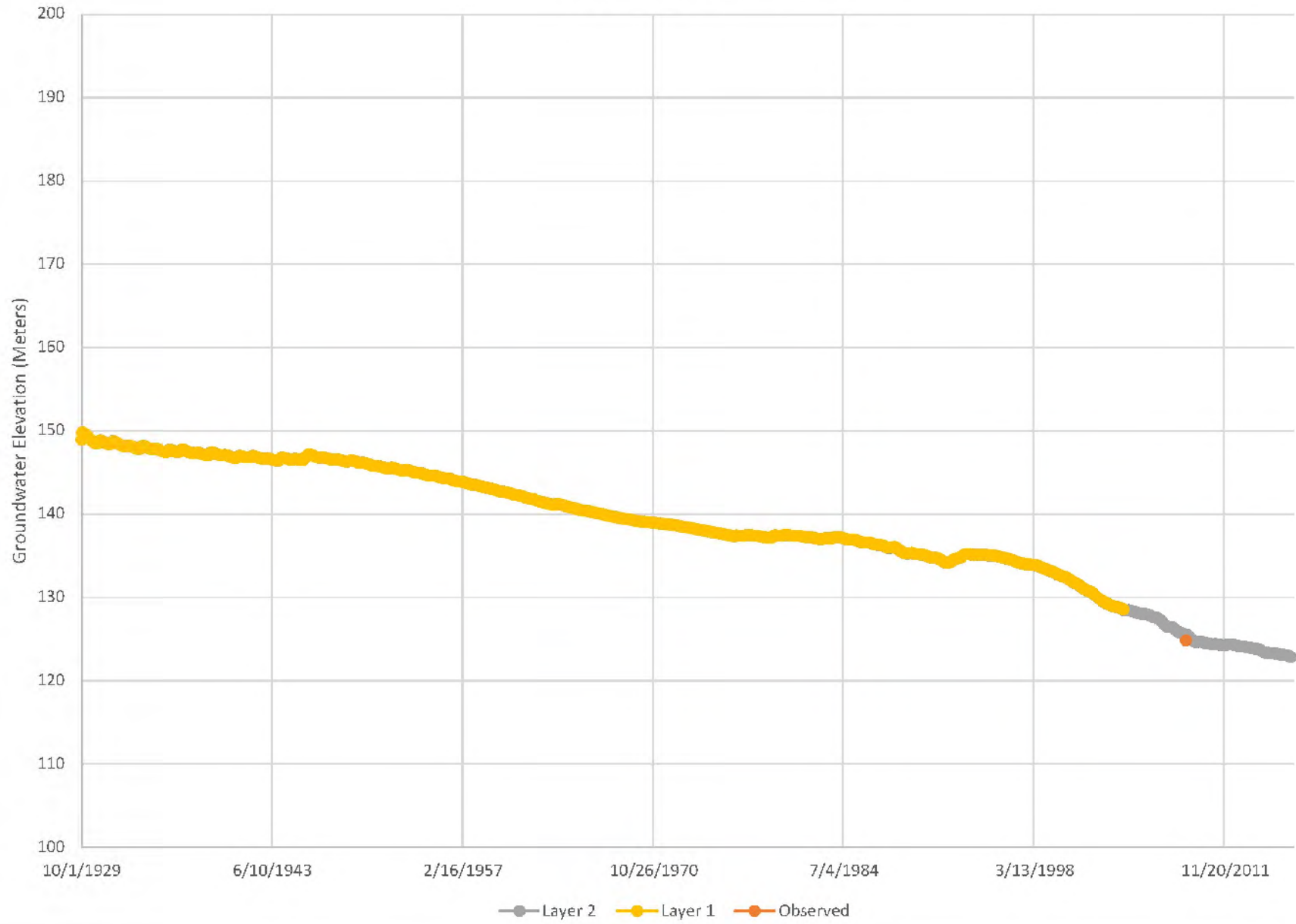
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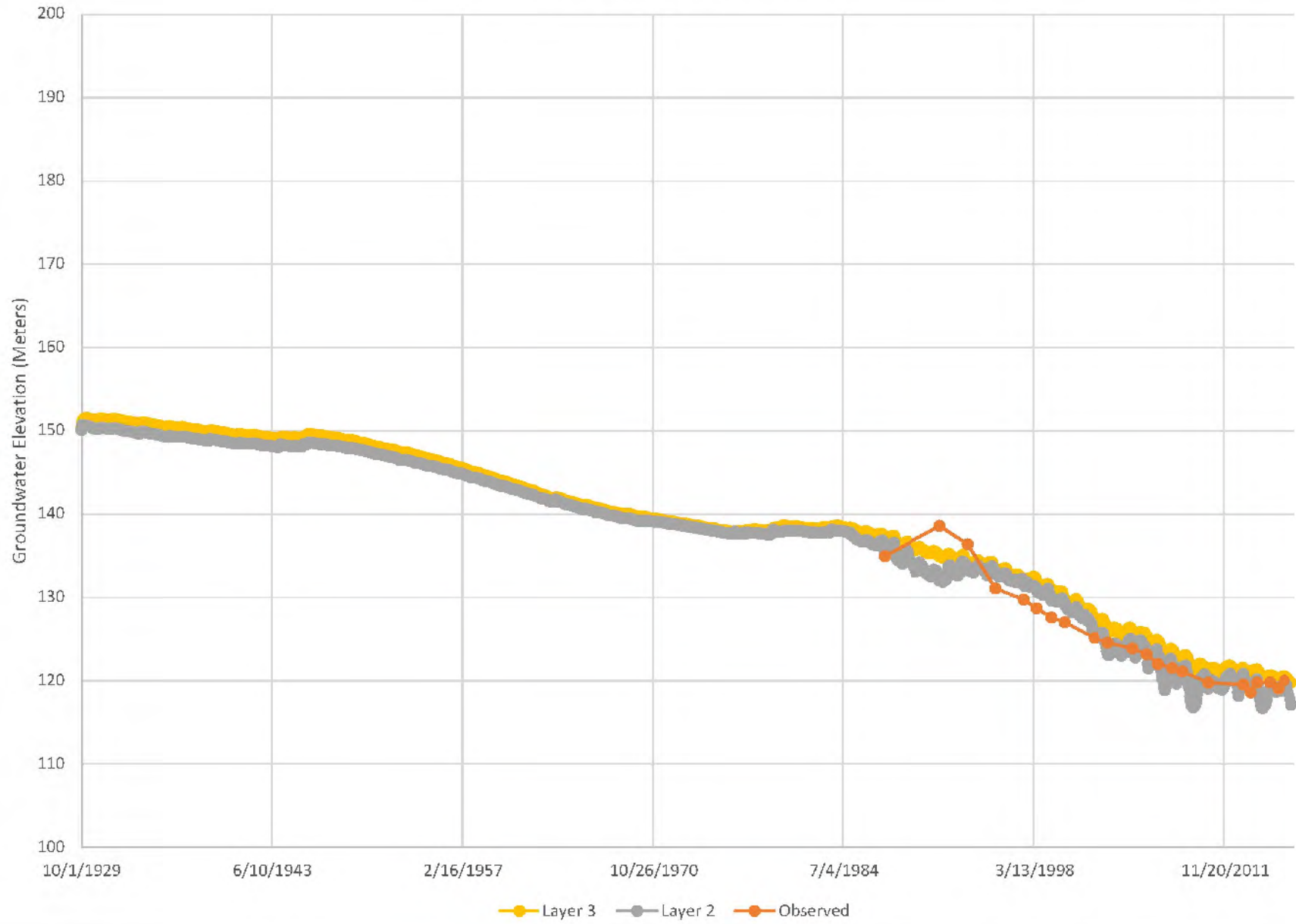
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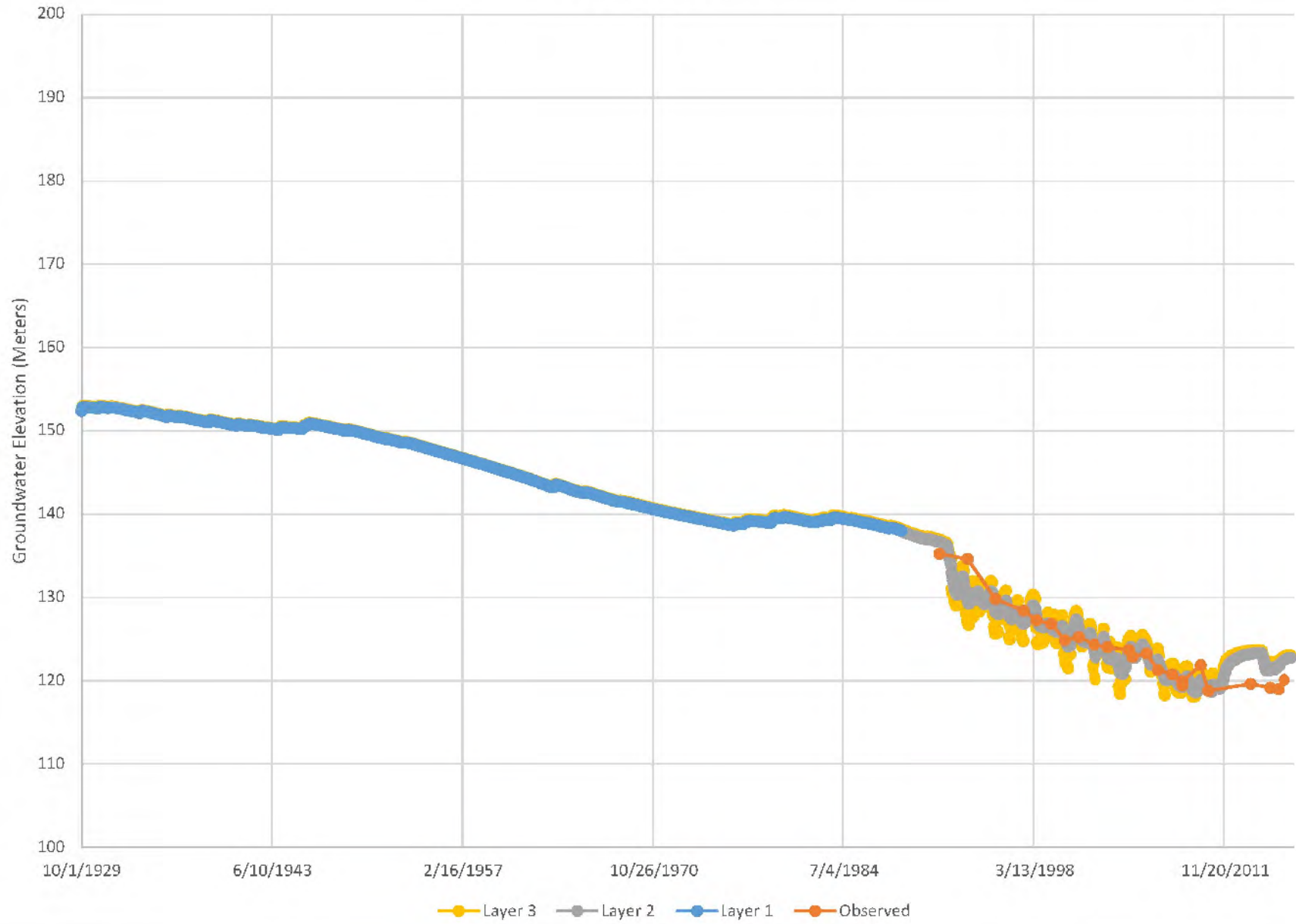
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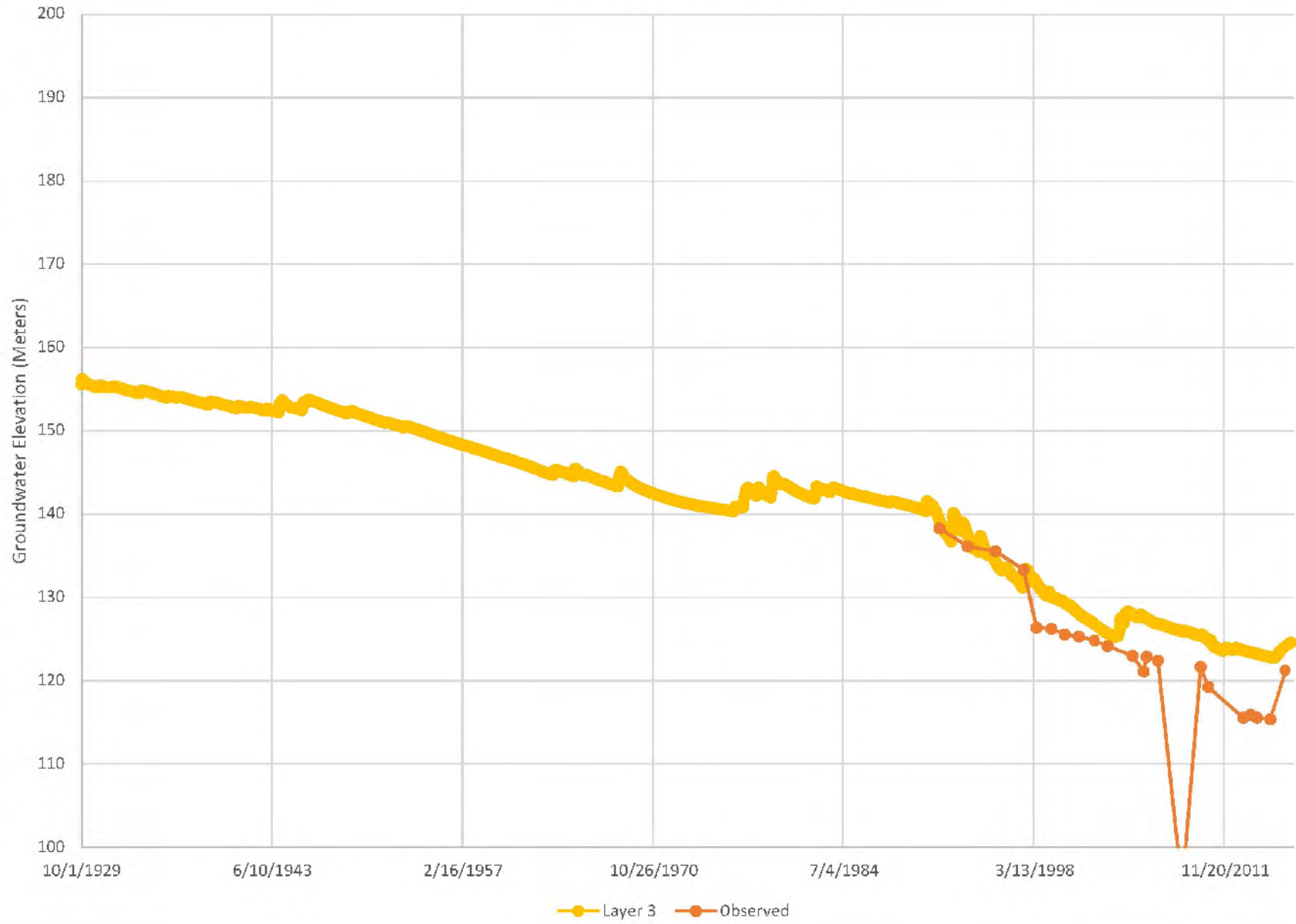
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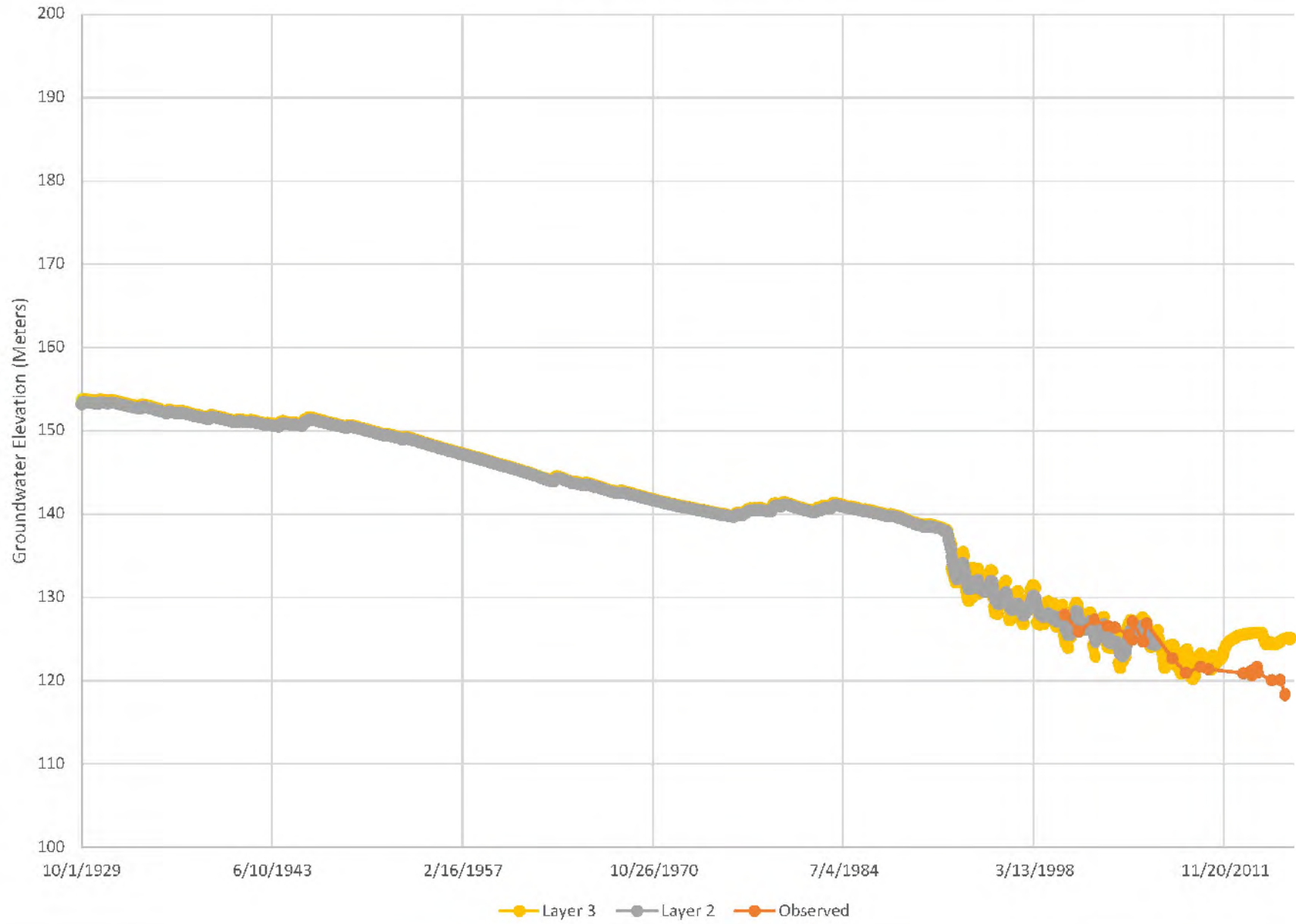
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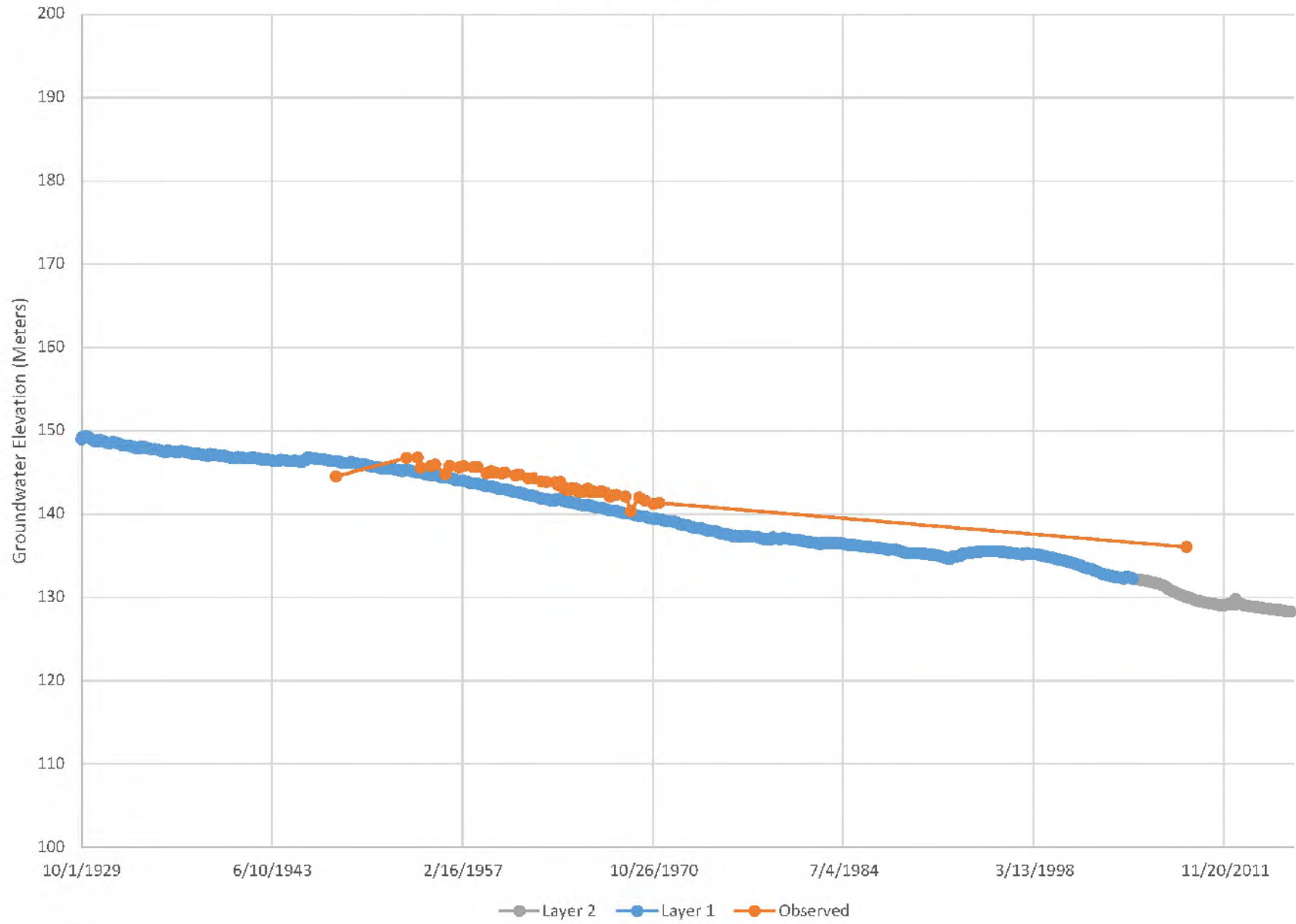
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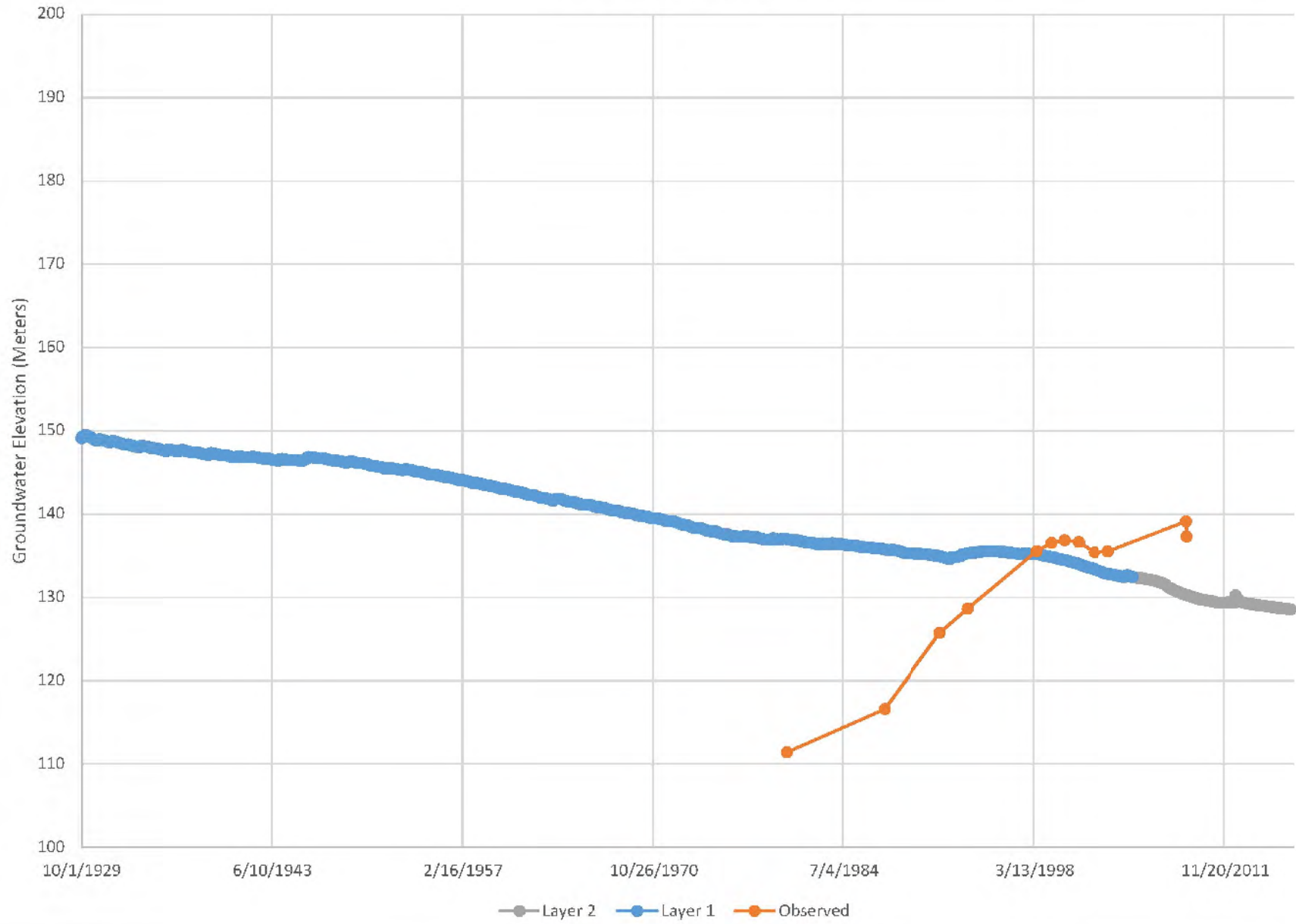
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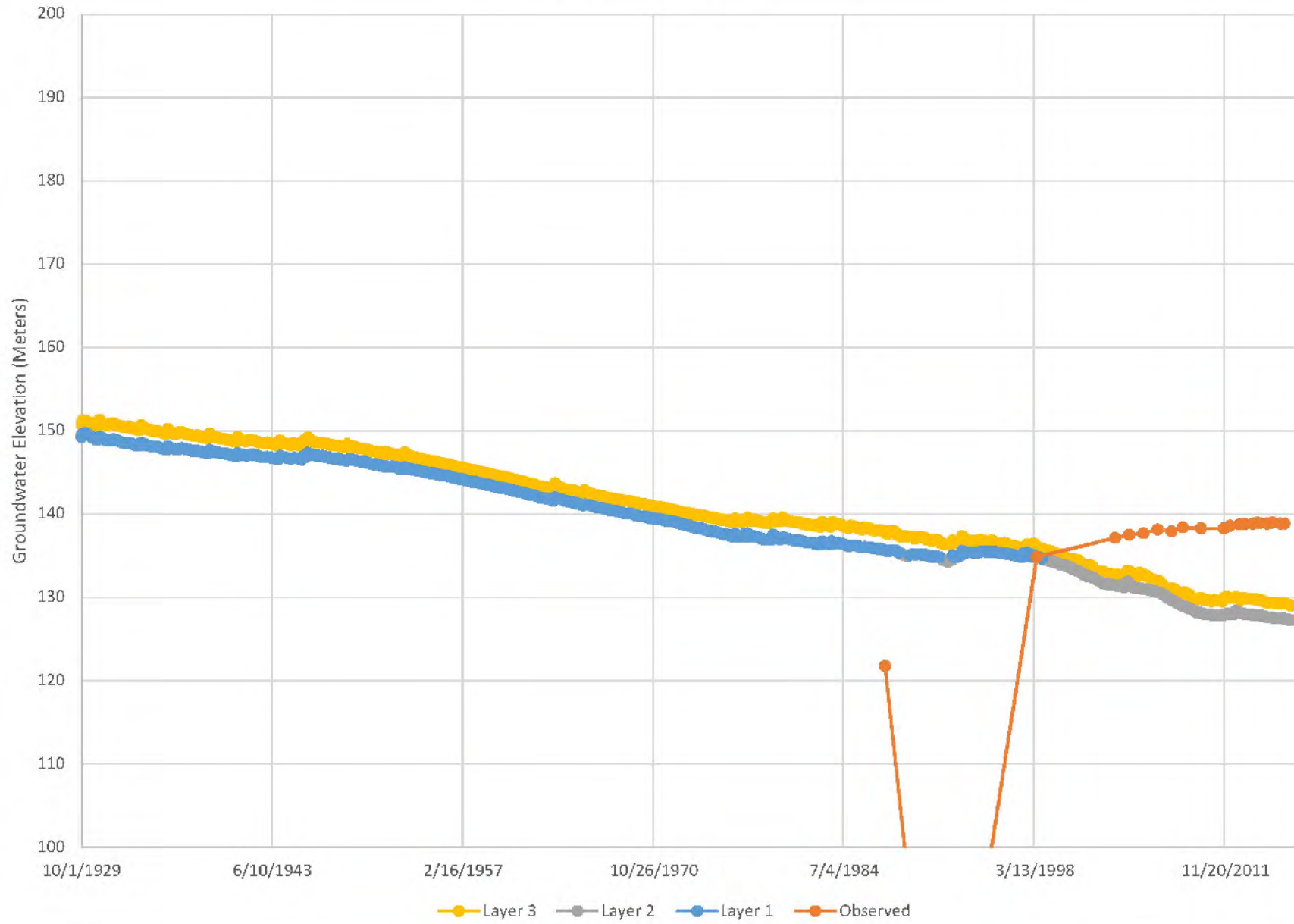
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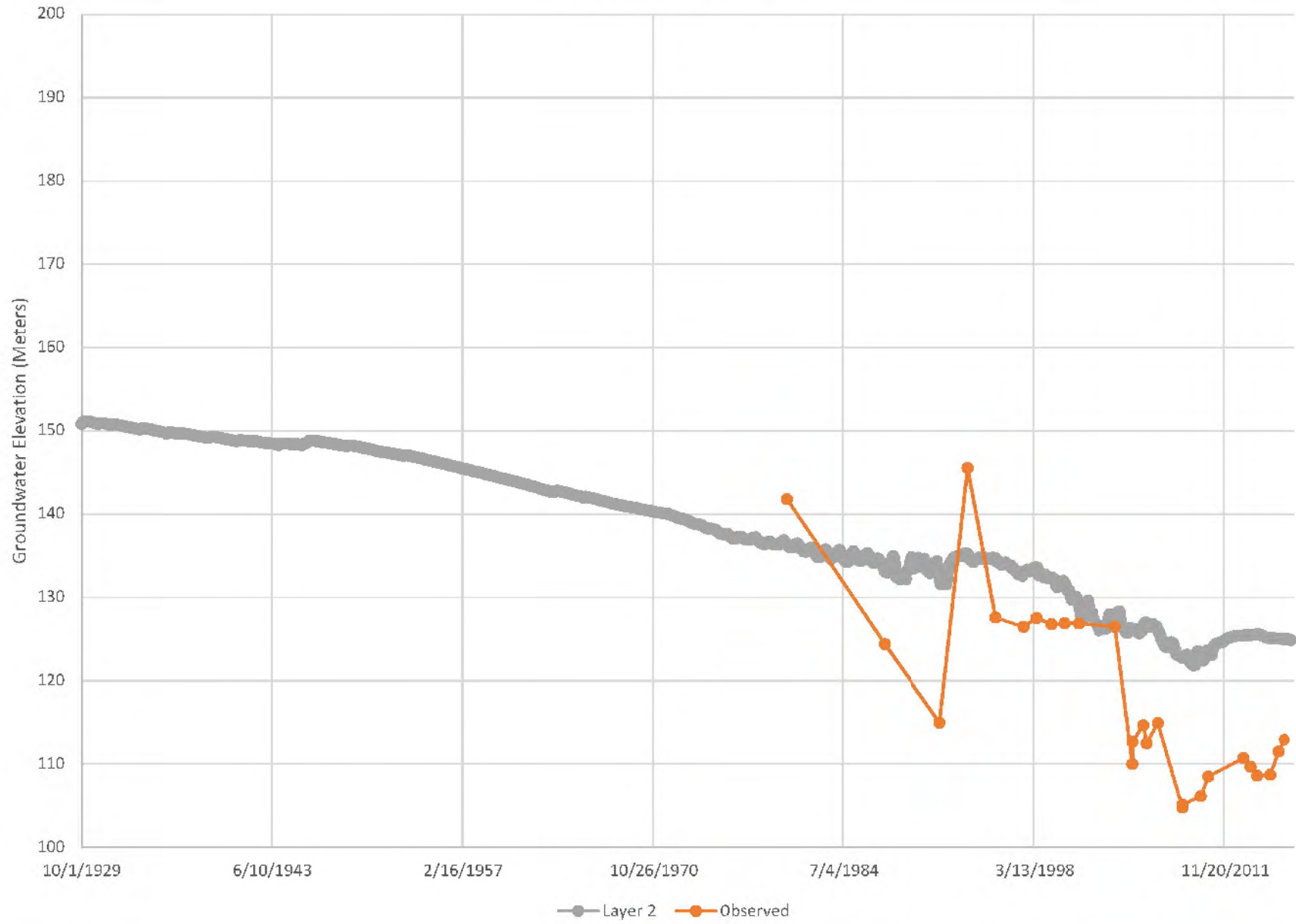
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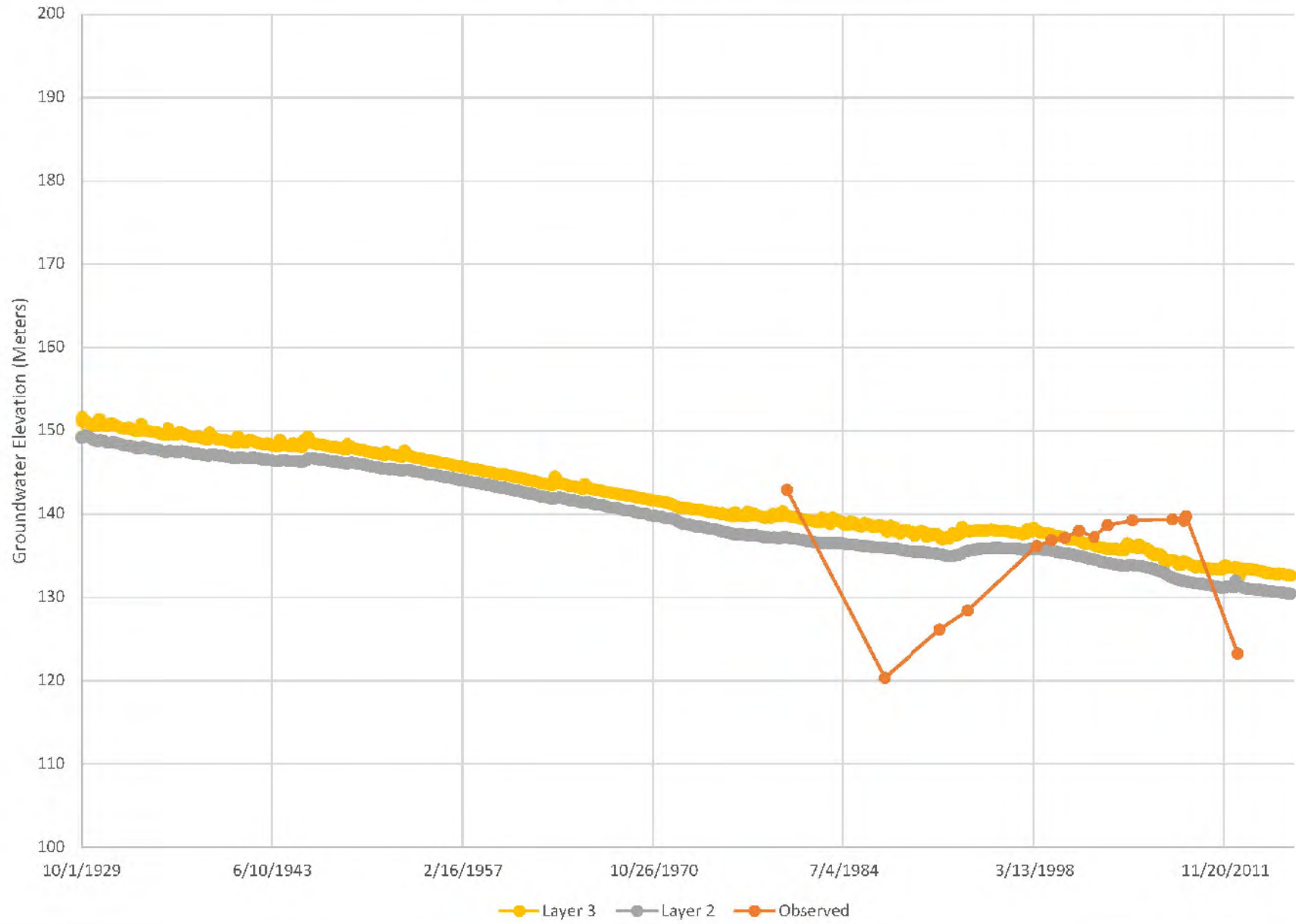
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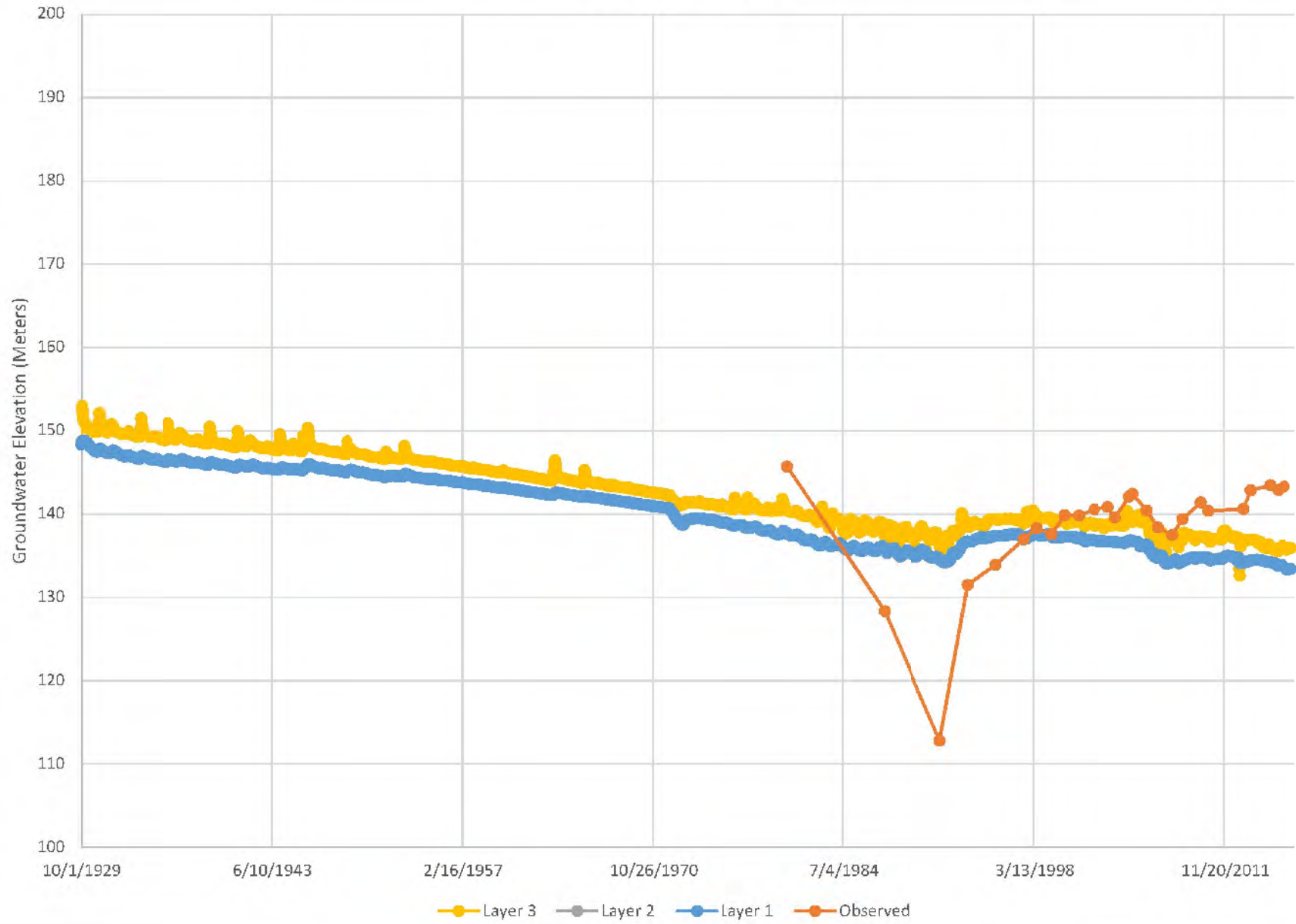
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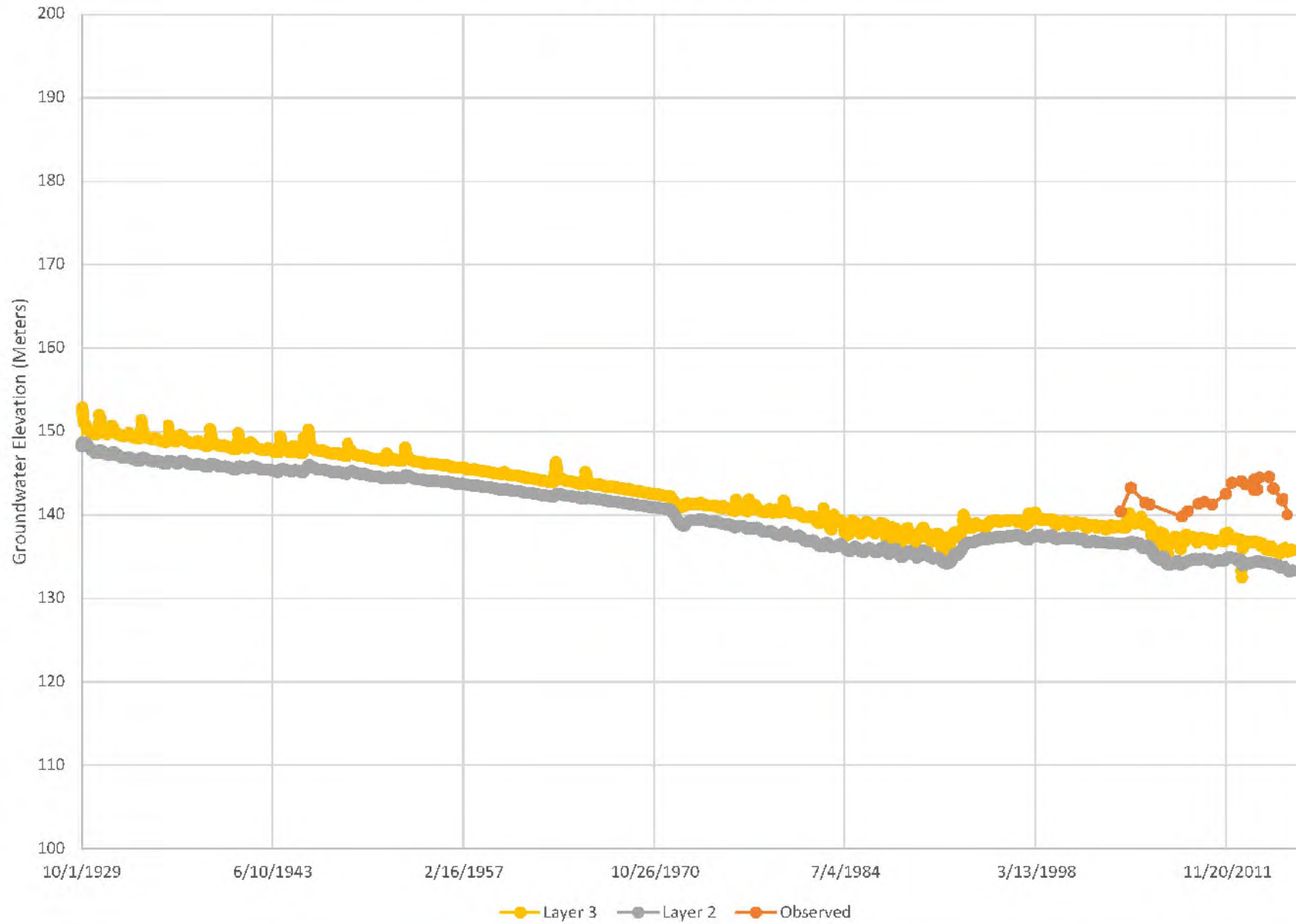
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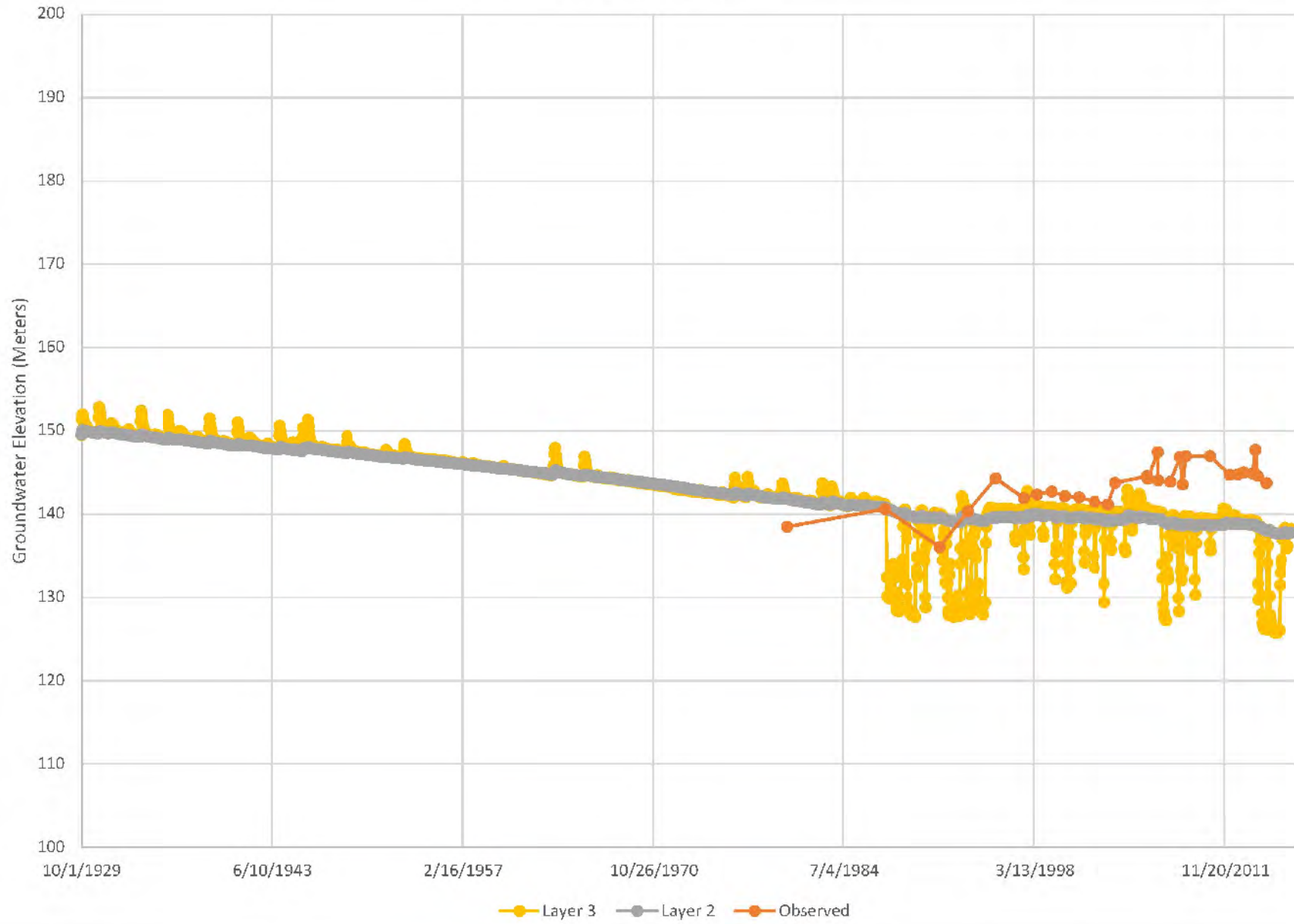
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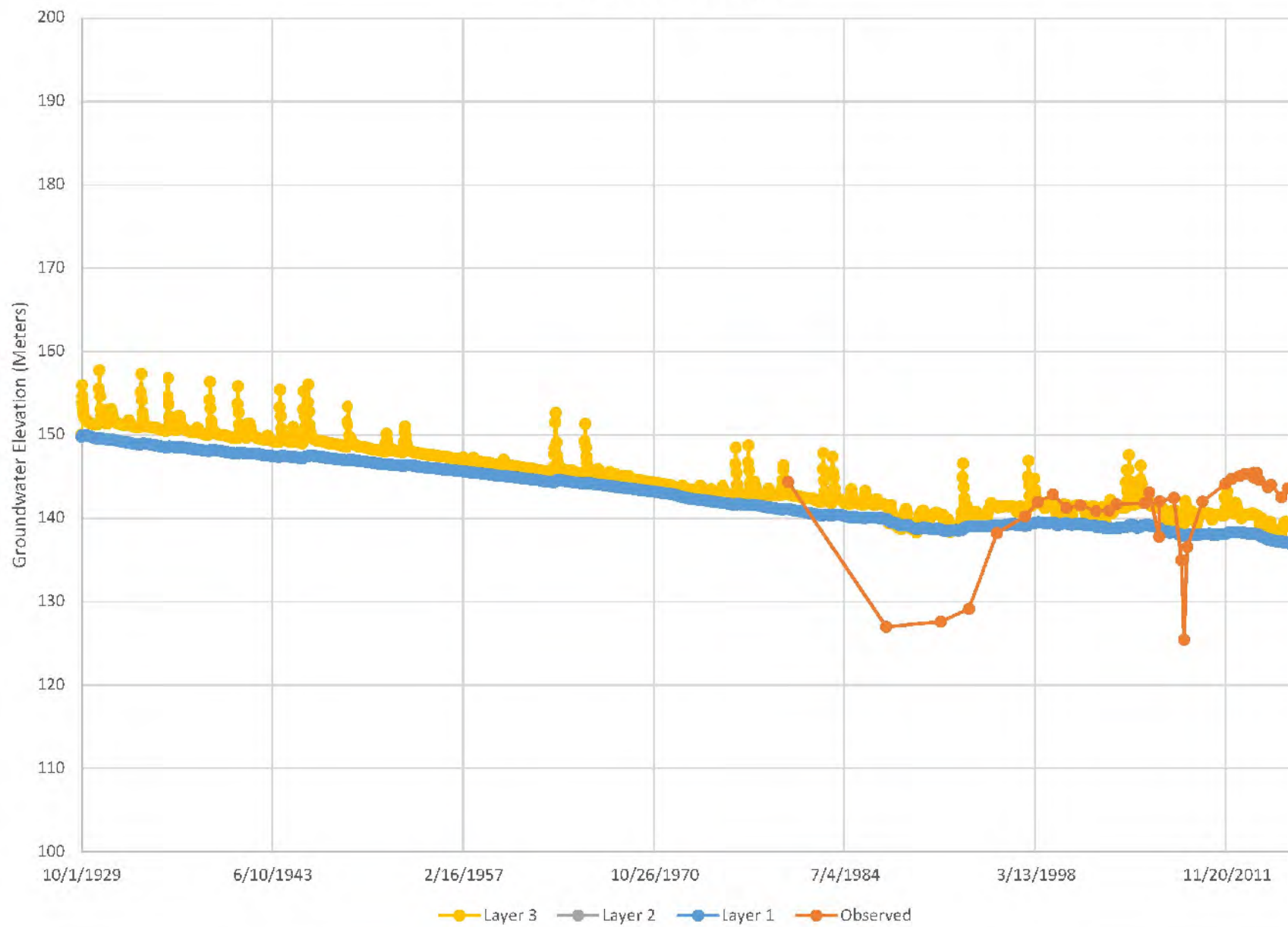
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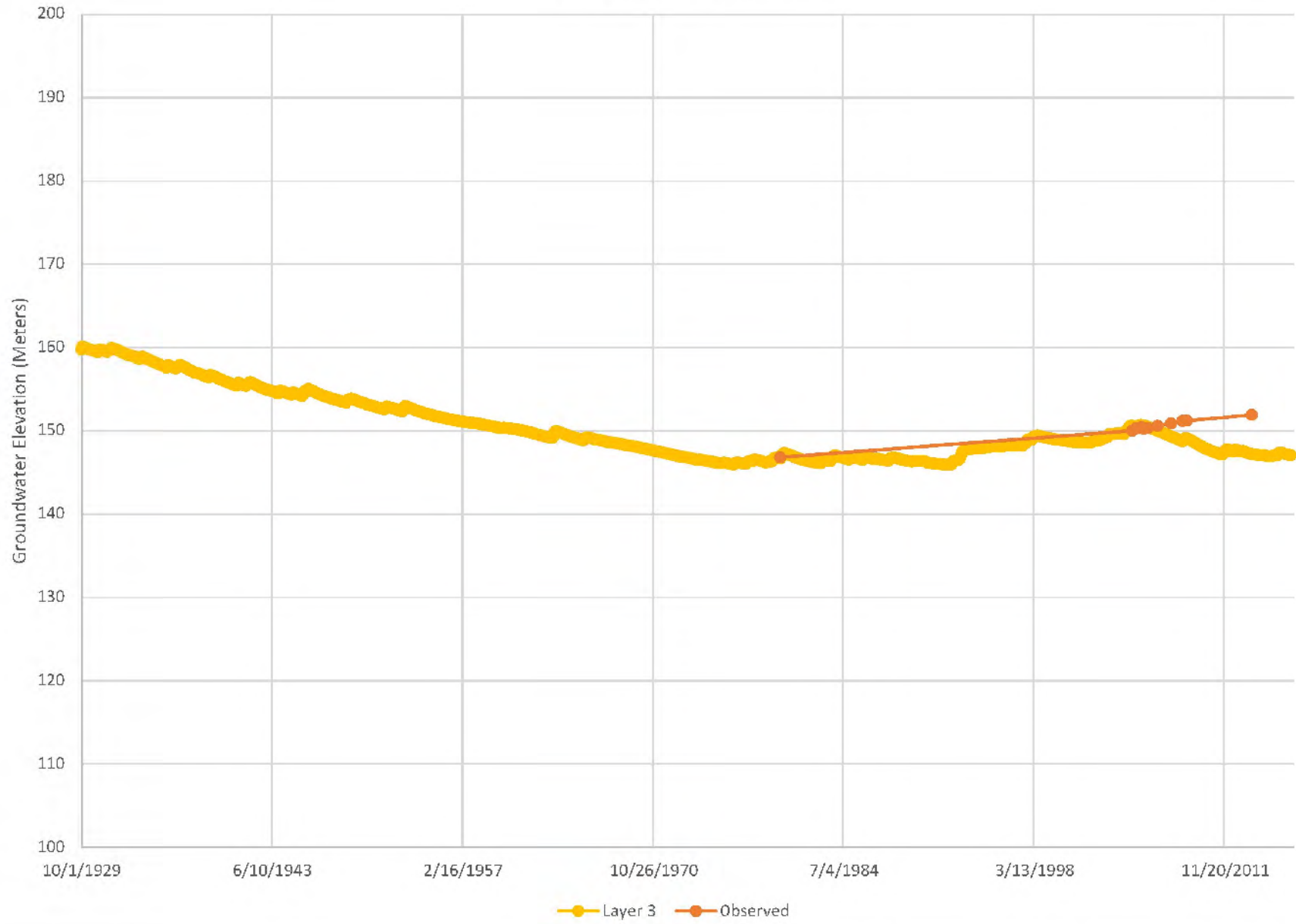
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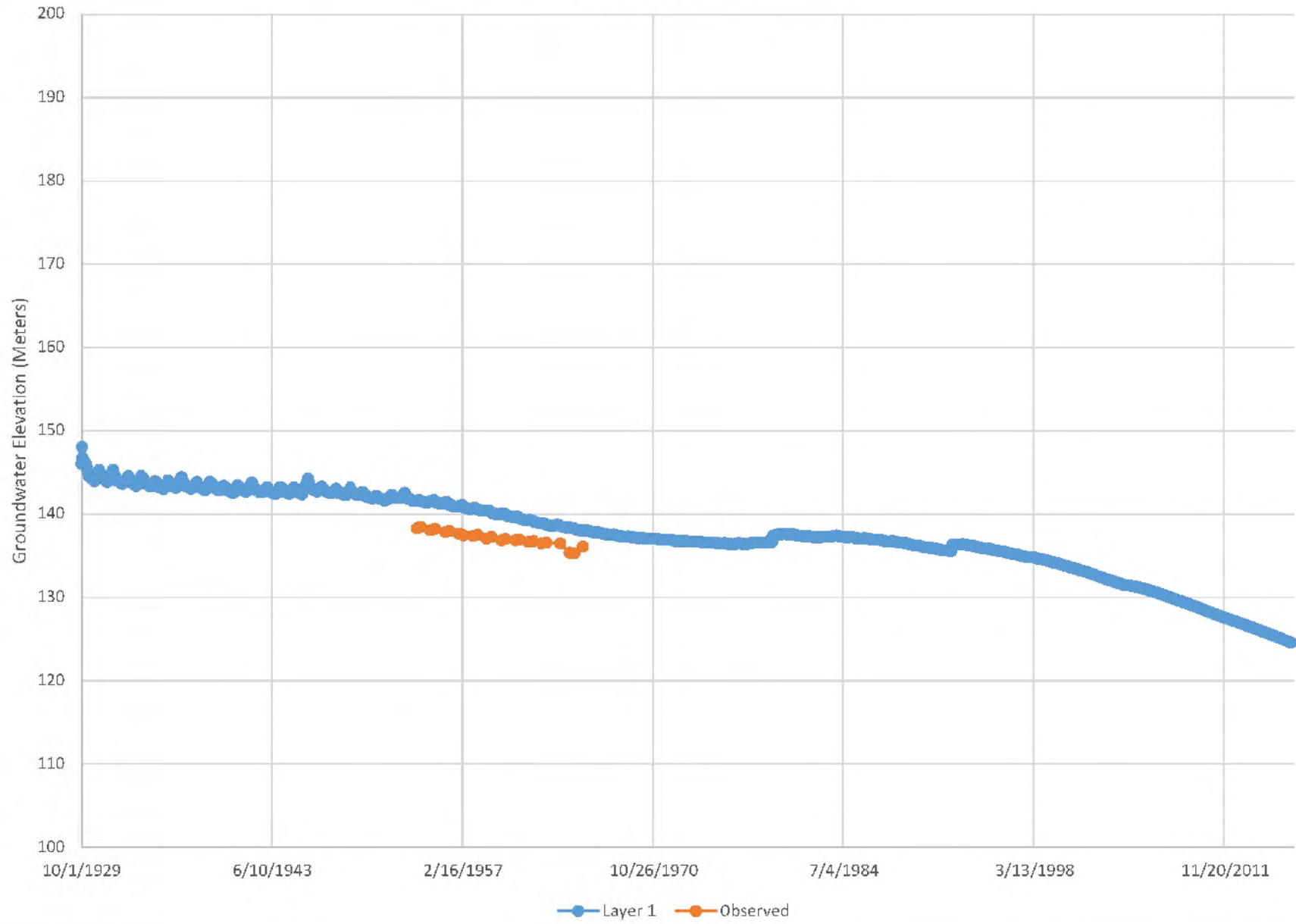
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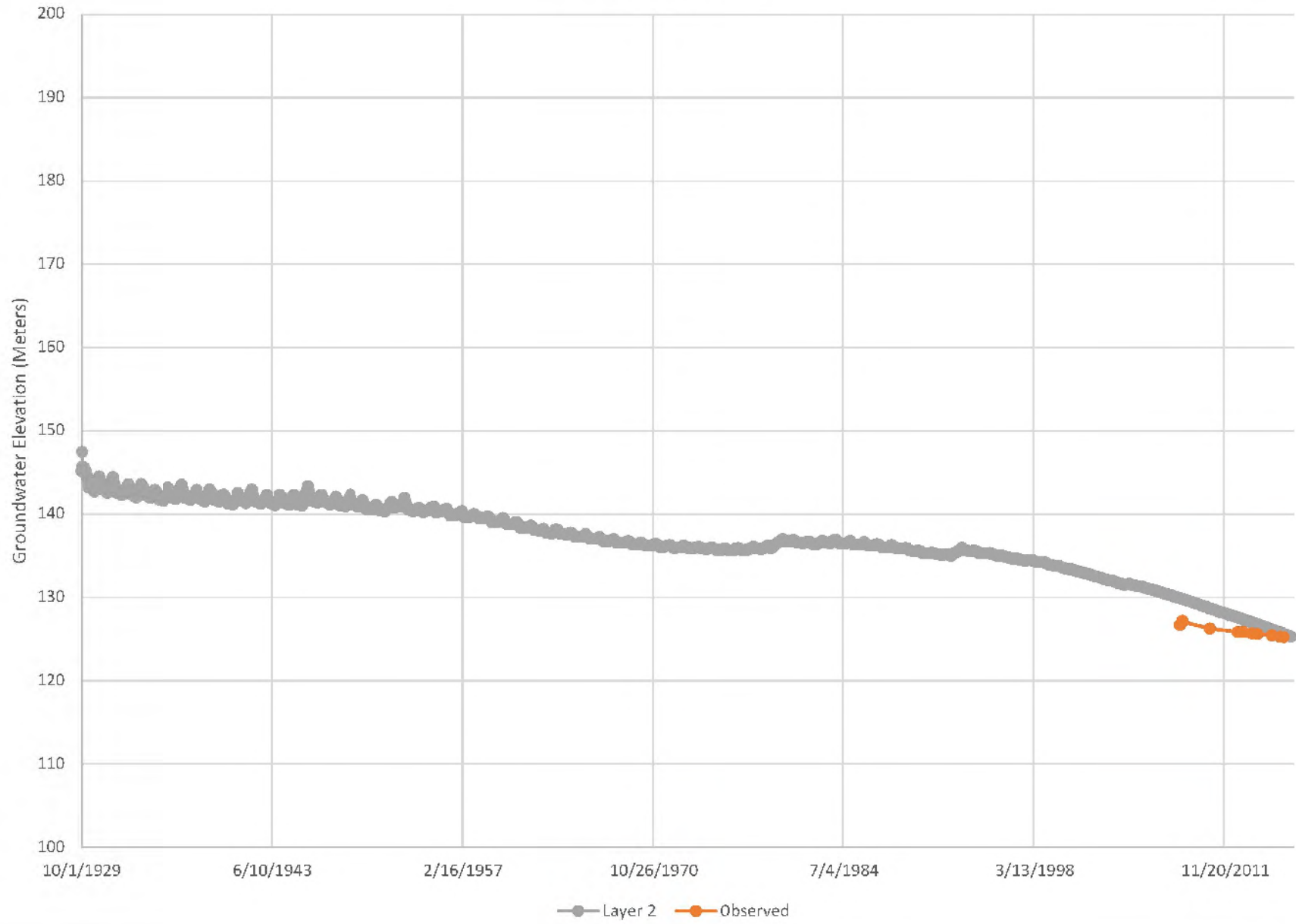
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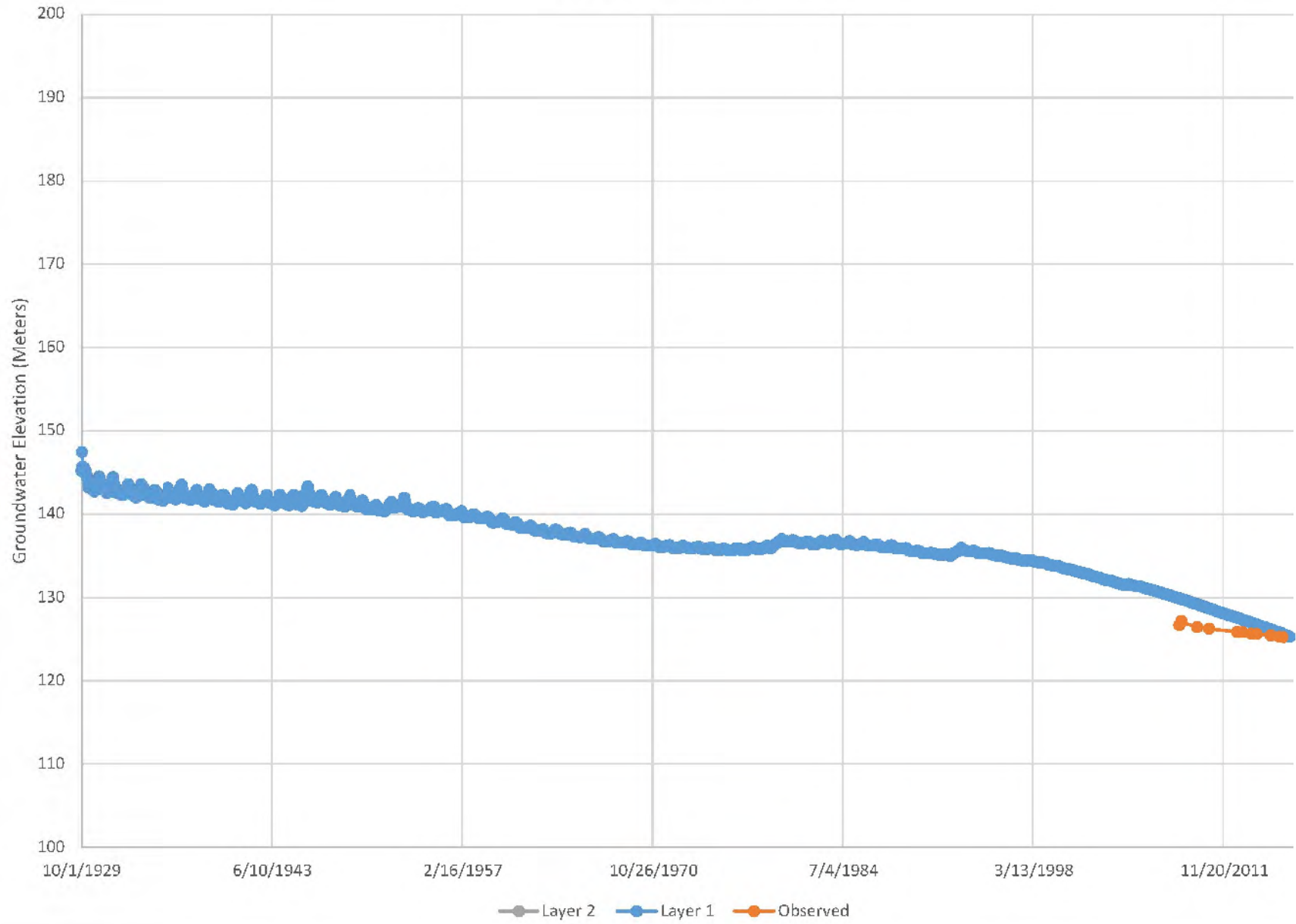
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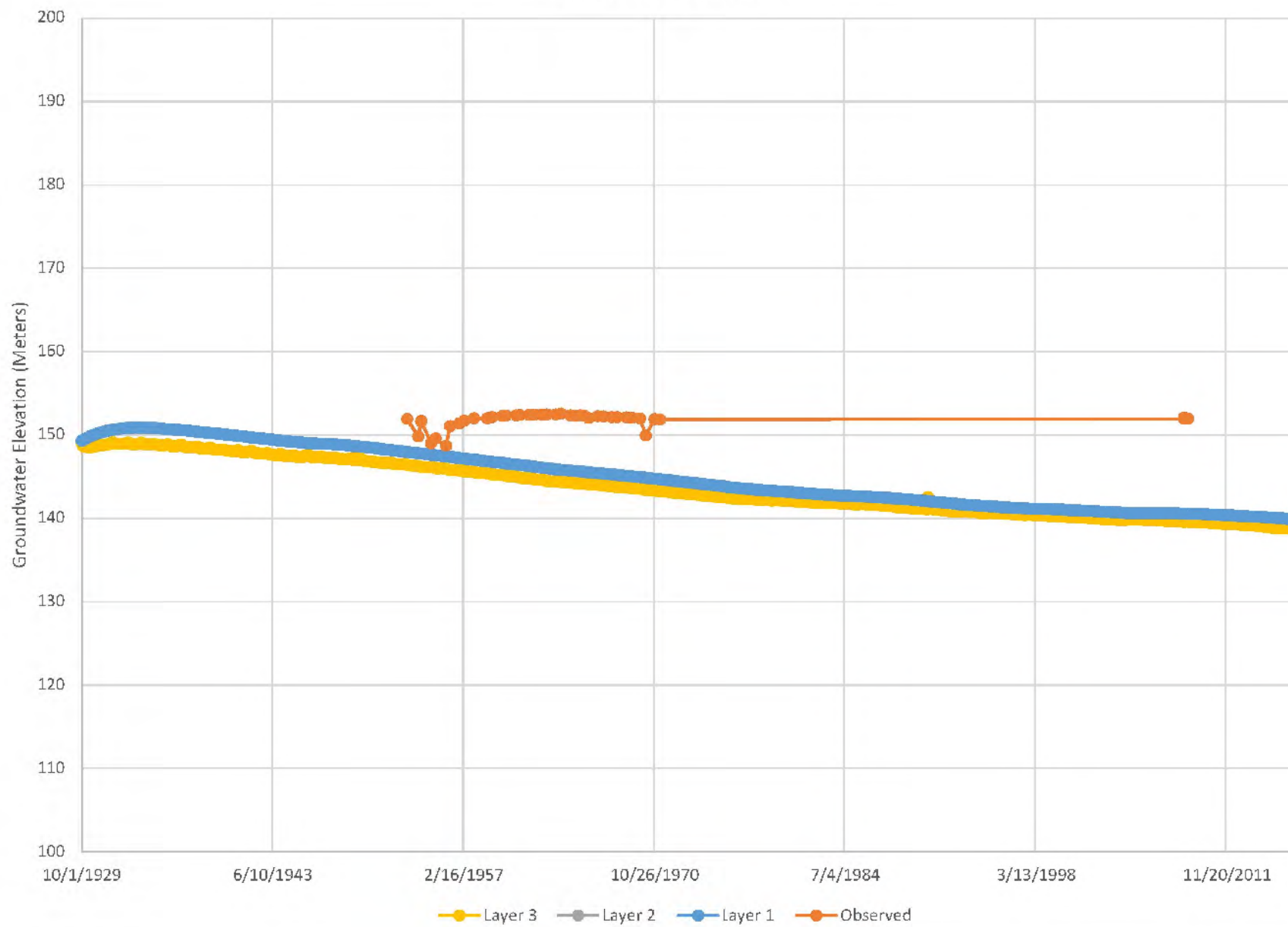
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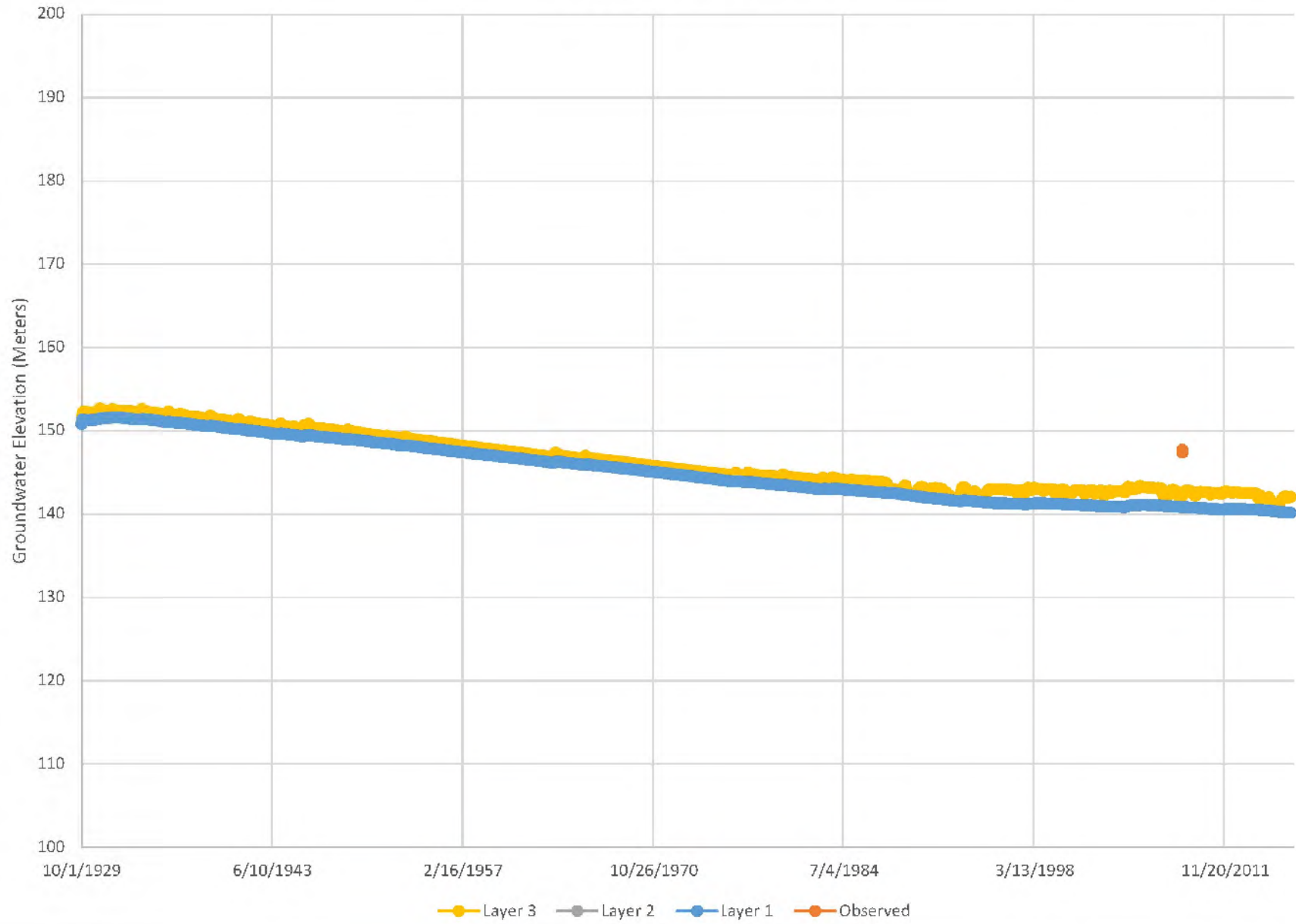
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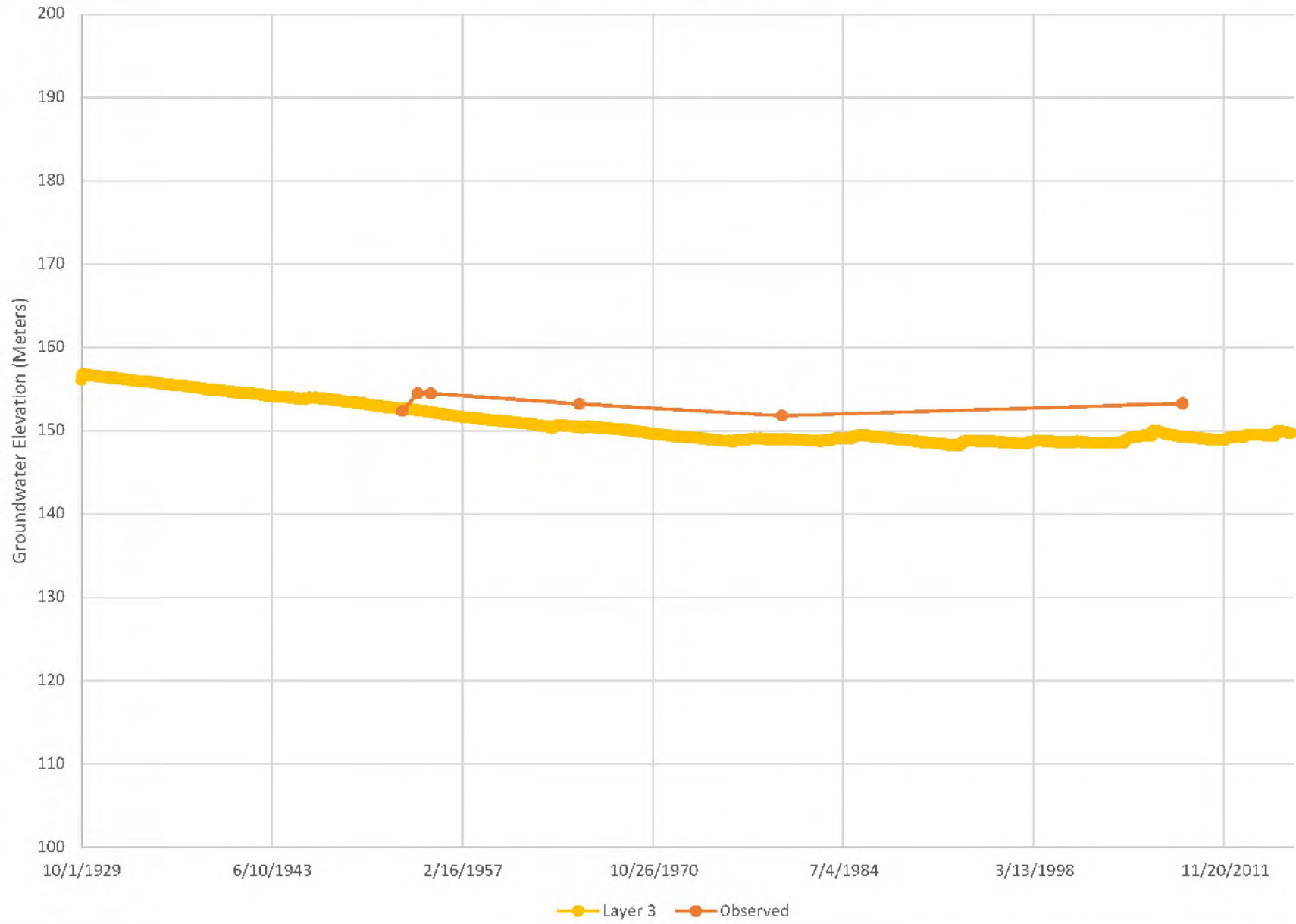
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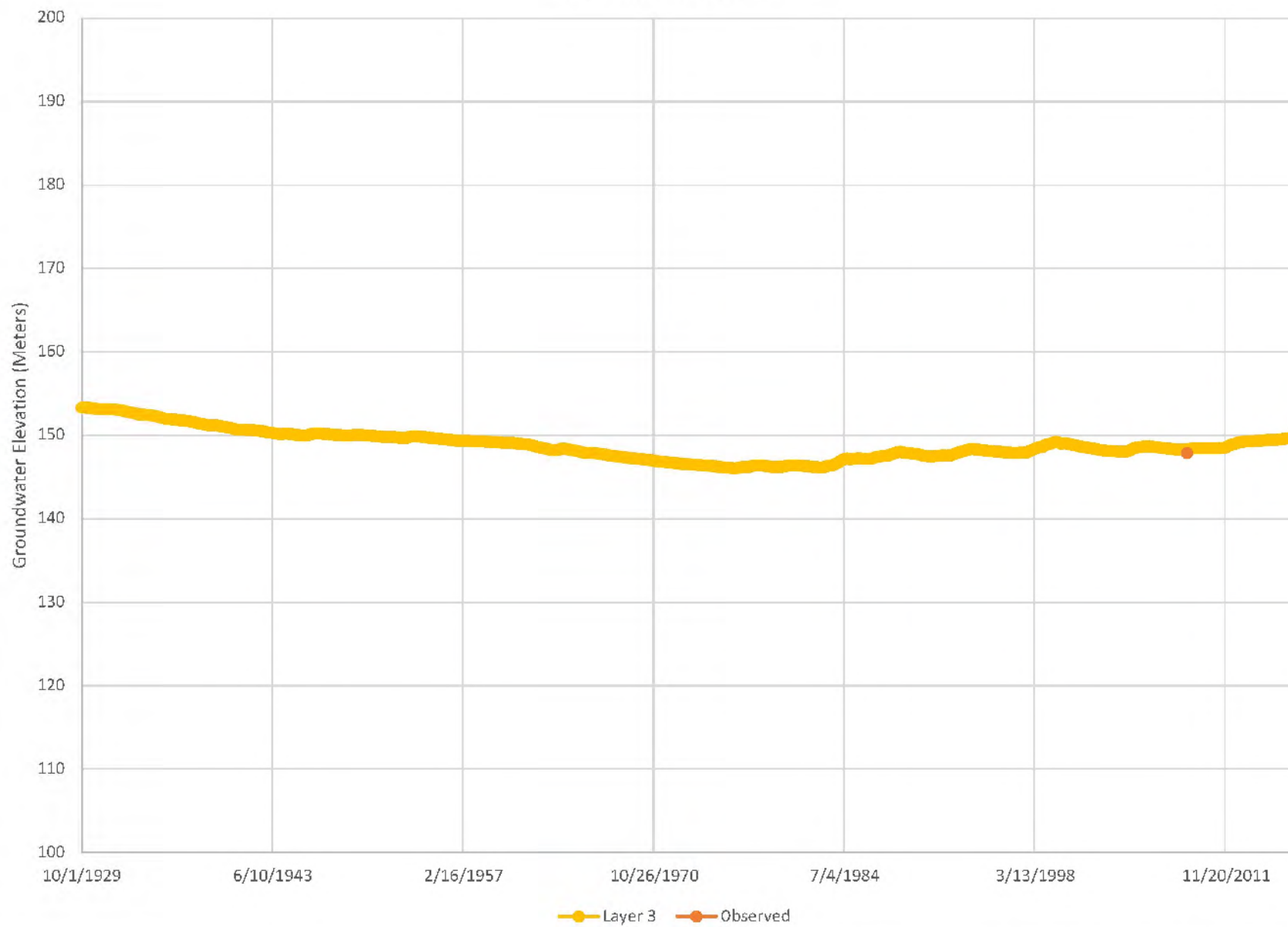
011S007E30G004S



011S007E32Q001S



012S007E03M002S



Local Well Name	SWD	Complete State Well ID	GPS_LSD_feet NAVD88	Lat_NAD83	Long_NAD_83	Record of Data	Number of Observations in Original .hob file	Additional Observations in Updated .hob file?	Total Observations
State Park Well #1	5E25R01	010S005E25R001S	732.454	33.2704654	-116.4040353	7/21/1965	1		1
State Park Well #2	5E36A01	010S005E36A001S	717.7	33.2702099	-116.4018406	7/21/1965 - 6/14/2006	78		78
Gabrych #2	6E01C01	011S006E01C001S	520.41	33.257253	-116.3046987	1/7/1953 - 3/24/2009	12		12
	6E02C03	011S006E02C003S	514.73	33.2564882	-116.3258776	12/8/1992 - 1/10/2007	50		50
Cameron 2	6E04F01	011S006E04F001S	536.9	33.2496504	-116.3571003	2/12/2004 - 3/26/2009	6	2	8
Viking Ranch	6E04Q01	010S006E04Q001S	728.3134495	33.9253524	-116.358924	2/24/1993 - 12/2/2008	7		7
5F1	6E05F01	010S006E05F001S	805.7401995	33.3327159	-116.3803756	10/1/1951 - 12/4/2008	2		2
	6E05P01	011S006E05P001S	604.7413333	33.2431107	-116.3787569	2/18/1953 - 8/7/1980	40		40
ID4-2	6E07K03	011S006E07K003S	710.0612828	33.2316004	-116.388735	6/30/1980 - 12/3/2008	17	10	27
	6E08H01	010S006E08H001S	753.6311667	33.3224044	-116.3761319	11/28/1955 - 3/30/1971	31		31
Charmer 2	6E08F01	010S006E08F001S	744.8948661	33.3205349	-116.3764482	12/5/2008 - 3/12/2009	2	2	4
	6E09C01	010S006E09C001S	719.56	33.32169	-116.361	12/3/2008	1		1
ID5-5	6E09E01	011S006E09E001S	576.36	33.23707	-116.3643	2/12/2004 - 3/23/2016	3	10	13
	6E09L01	010S006E09L001S	721	33.31806	-116.3628	7/26/1965 - 1/5/2006	93		93
Allegre 1	6E09H01	010S006E09H001S	709.4571995	33.3144971	-116.3666957	7/26/1965	1		1
	6E10L01	010S006E10L001S	687	33.31778	-116.3447	2/12/2004 - 1/5/2006	3		3
	6E10M01	010S006E10M001S	700.22	33.31806	-116.3489	8/23/1980 - 1/5/2006	6		6
Abandoned Motel 1	6E10W01	011S006E10W001S	528.42	33.2403581	-116.3470455	2/18/1953 - 3/11/2009	28		28
Abandoned Motel 4	6E10W04	011S006E10W004S	527.407	33.2304793	-116.3468901	3/11/2009	1		1
Berkovitch	6E11B02	011S006E11B002S	497.608	33.2421009	-116.3299876	11/16/1953 - 3/13/2009	116		116
Burned House 1 (UNK 23)	6E11M01	011S006E11M001S	485.856	33.2336746	-116.3277347	2/18/1953 - 8/13/1980	39		39
Sink -12G1	6E12G01	011S006E12G001S	479.314	33.236665	-116.3027244	7/31/1965 - 3/26/2009	9		9
Levie Well (UNK -25)	6E15E02	011S006E15E002S	518.186	33.22382	-116.3438373	12/9/1953 - 11/18/2004	89		89
	6E15F01	011S006E15F001S	520.62	33.22126	-116.3428	1/2/1950 - 8/5/1965	12		12
County Yard	6E15G01	011S006E15G001S	508.846	33.2209642	-116.337612	3/11/2009	1		1
ID 1-12	6E16A02	011S006E16A002S	532.2420328	33.2260283	-116.3483151	6/30/1987 - 3/23/2016	15	2	17
ID 1-16	6E16H01	011S006E16H001S	619.5980328	33.2165561	-116.3624389	6/30/1991 - 3/23/16	16	2	18
	6E17J01	010S006E17J001S	680	33.30446	-116.36731	5/15/2009	1		1
ID 4-18	6E18J01	010S006E18J001S	691.0615328	33.3067494	-116.3847128	6/30/1987 - 3/23/2016	18	8	26
ID4-10	6E18L01	011S006E18L001S	230.2868661	33.2183181	-116.3922241	6/30/1991 - 4/20/2016	16	2	18
ID4-3	6E18R01	010S006E18R001S	666.1883661	33.2980381	-116.3843375	6/30/1980 - 4/12/2016	17	2	19
Wilcox	6E20A01	011S006E20A001S	700.1320328	33.2109086	-116.3648249	6/5/2000 - 4/22/2016	12	11	23
Empty Irrigation	6E20L01	010S006E20L001S	628.0611995	33.2883354	-116.3753965	7/27/1987 - 4/15/2009	90	1	91
21A1	6E21A01	010S006E21A001S	639.466	33.3003606	-116.3510138	6/24/1952 - 4/25/1994	306		306
MW-1	6E21A02	010S006E21A002S	636.6640328	33.300632	-116.34947	7/15/2004 - 4/12/2016	150	15	165
	6E21B01	010S006E21B001S	642	33.3	-116.3528	11/9/1954 - 2/12/2004	2		2
	6E21B02	010S006E21B002S	642	33.29778	-116.3545	8/25/1980 - 6/14/2006	7		7
	6E21F01	010S006E21F001S	638	33.29556	-116.3572	8/25/1980	1		1
Bakko	6E22A01	011S006E22A001S	530.842	33.2109517	-116.3308721	1/1/1948 - 3/24/2009	79		79
Triangle	6E22A02	011S006E22A002S	534.165	33.2103236	-116.3308641	6/30/1980 - 3/24/2009	12		12
Paddock	6E22B01	011S006E22B001S	535.8768661	33.2115916	-116.3340344	6/30/1987 - 4/13/2016	8	16	24
ID1-10	6E22B01	011S006E22B001S	594.7405328	33.211789	-116.346812	6/30/1980 - 3/23/2016	18	8	26
La Casa	6E23E01	011S006E23E001S	539.5095	33.2080427	-116.328358	6/30/1980 - 3/12/2009	14	1	15
ID1-8	6E23J01	011S006E23J001S	525.1820328	33.2031595	-116.314343	6/30/1980 - 3/23/2016	19	7	26
MW-3	6E23J02	011S006E23J002S	521.8048661	33.2034814	-116.314253	5/19/2004 - 4/13/2016	4	21	25
	6E23M01	010S006E23M001S	592.3381995	33.2894852	-116.3322021	7/26/1965 - 8/12/2008	46		46
ID1-1	6E25A01	011S006E25A001S	525.2600328	33.1981194	-116.2958593	6/30/1980 - 11/29/2014	18	10	28

Data from 6E07Q02 from Nov 2011 to Apr 2016 was used for this well; appears to be the same.

Notes

Local Well Name	SWD	Complete State Well ID	GPS_LSD_feet NAVD88	Lat_NAD83	Long_NAD_83	Record of Data	Number of Observations in Original .hob file	Additional Observations in Updated .hob file?	Total Observations
ID 1-2	6E25C01	011S006E25C001S	575.7050328	33.1956535	-116.3041561	6/30/1980 12/1/2008	18	16	34
Grey Irrigation	6E25R01	010S006E25R001S	549.1793333	33.2738149	-116.298946	5/13/1998 - 1/1C/2007	31		31
Reiner	6E28Q01	010S006E28Q001S	572.1140328	33.274311	-116.3536038	2/12/2004 12/3/2008	4	1	5
ID4-4	6E29K02	010S006E29K002S	597.7210328	33.2771339	-116.3743253	6/30/1980 - 12/3/2008	18	7	25
	6E29R01	010S006E29R001S	597.661	33.2721996	-116.3794592	11/19/1952 3/30/1971	38		38
Vern Wittaker Horse Camp	6E31E03	009S006E31E003S	930.3501161	33.3492614	-116.4003436	6/4/2007 - 5/13/2009	7		7
ID4-11	6E32D01	010S006E32D001S	614.0616995	33.2674976	-116.383355	6/30/1995 5/21/2006	10	6	16
ID4-1	6E32R01	010S006E32R001S	572.8343661	33.2574843	-116.371033	6/30/1980 - 3/23/2016	80	17	97
Springs 2	6E33C02	010S006E33C002S	567.2021995	33.2690937	-116.3575937	2/12/2004 12/3/2008	4		4
Palleson	6E33J01	010S006E33J001S	544.9883661	33.2615613	-116.3487493	2/12/2004 - 4/14/2009	14	3	17
ID4-5	6E33Q01	010S006E33Q001S	551.7050328	33.2574265	-116.3558975	6/30/1980 4/12/2016	9	13	22
Army Well	6E34A01	011S006E34A001S	923.5406161	33.1841476	-116.332836	1/1/1980 - 3/25/2009	11		11
UEC North	6E34D01	010S006E33C002S	567.2021995	33.2690937	-116.3575937	2/136/1985 12/4/2008	95		95
Redimix Plant (De Anza Ready Mix)	6E34R01	010S006E34R001S	535.8470328	33.2631797	-116.337553	6/26/1952 - 12/4/2008	7		7
UEC South	6E34M01	010S006E34M001S	547.0167828	33.2633086	-116.3476665	7/19/1984 12/4/2008	99		99
Airport 2	6E35R01	010S006E35R001S	516.1716995	33.2573849	-116.3261017	12/21/1954 - 4/12/2016	84	2	86
	6E35Q01	010S006E35Q001S	517.75	33.25756	-116.3131	12/11/2008 4/12/2016	1	15	16
Hawkins	6E36Q01	010S006E36Q001S	526.108	33.2584903	-116.3003201	4/4/1951 - 3/10/2009	99		99
	7E03M02	012S007E03M002S	726.5	33.16147	-116.24195	3/12/2009	1		1
Sink-7N1	7E07R01	011S007E07R001S	481.701	33.2329882	-116.291279	11/20/1953 - 10/25/1965	24		24
MW-5A	7E07R01	011S007E07R002S	465.1440328	33.2265556	-116.2793511	12/1/2008 3/23/2016	2	2	4
MW-5B	7E07R02	011S007E07R001S	465.1440328	33.2265556	-116.2793511	12/1/2008 - 3/23/2016	2	9	11
Bing Crosby	7E20P01	011S007E20P001S	568.9900328	33.1994879	-116.2679378	2/18/1953 3/13/2009	41		41
Sky Ranch	7E30G04	011S007E30G004S	561.7194495	33.1930388	-116.2826187	12/1/2008 - 12/4/2008	2		2
Hayden	7E32Q01	011S007E32Q001S	693.4969495	33.1739977	-116.2643182	11/2/1952 12/5/2008	6		6

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Notes